

General

Cardiology

Chest

Abdomen

Neurology

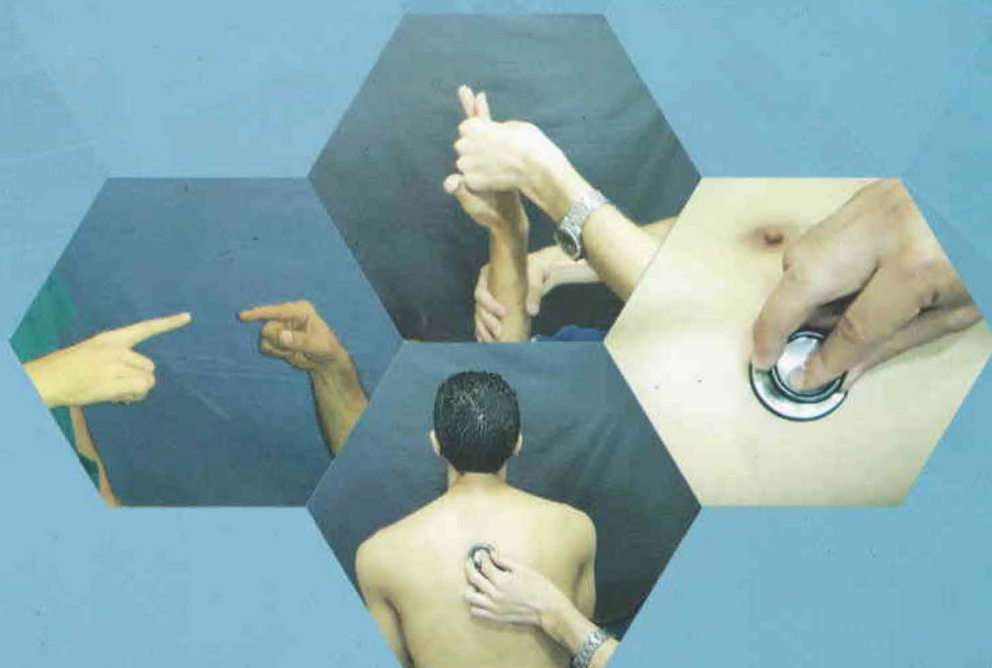
Rheumatology

Others



Allam's Clinical Examination

Dr/ M. Allam MD



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ALLAM'S CLINICAL EXAMINATION



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GENERAL

||

Rare presentations of common diseases are much more common than common presentations of rare diseases

||

GENERAL SHEET

1- History:

2- Examination:

3- Investigations.

4- Diagnosis.

5- Treatment.

General
Local

Personal history.

Complaint.

History of present illness:

Past history

Family history.

HISTORY

► Personal History: NAS OMRH

1. Name: اسم حضرتك ايه؟ (الإسم ثلاثي)

- To be familiar with the patient.
- Sex identification.
- False errors may occur when two patients with the same name have been under treatment in the hospital simultaneously.
- For follow up.

2. Age: عندك كام سنة؟

Diseases common in children	Diseases common in old age
• Rheumatic fever. • T.B. • Hemolytic anemia. • Acute leukemia. • Poliomyelitis. • Duchenne myopathy. • Friedrich's ataxia.	• Bronchogenic Carcinoma. • Atherosclerosis and coronary artery disease. • Cor pulmonale. • Chronic lymphatic leukemia. • Multiple myeloma.

► N.B.

Tumors occur in children:

- Wilm's tumor of the kidney.
- Retinoblastoma.
- Medulloblastoma

3. Sex:

Diseases common in male	Diseases in female
• I.H.D., Hemophilia, Duchenne (X-linked) • Bronchogenic carcinoma	• S.L.E, Thyrotoxicosis & Myxoedema. • Chorea, Myasthenia.

4. Occupation: بتشغل ايه؟

- **lead worker:** anemia – nephropathy – peripheral neuropathy.
- **Glass workers (Silicosis):** interstitial pulmonary fibrosis (IPF).
- **Asbestosis:** IPF – bronchogenic carcinoma or mesothelioma.

- **Farmers:** bilharziasis – farmer's lung.
- **Medical staff:** infection – X-ray irradiation (bone marrow depression – sterility).

5. Marital state: متزوج؟ عندك اولاد؟ كام؟ اصغرهم عنده كام سنة؟

Ask about

1. Duration of marriage.
2. Number of children.
3. The age of the youngest one.

6. Residence: ساكن فين؟؟ مولود وعائش طول عمرك هناك؟؟

May reflect socioeconomic condition and may occasionally point to a certain disease e.g:

- **Country:** Bilharziasis – exposure to animals (Brucellosis) – insecticides.
- **Towns:** anxiety – hypertension – IHD.
- **Sharkia:** Filariasis!!!

7. Special habits:

Special habit is a habit that makes the patient more susceptible than others to a certain disease

بتدخن؟ كام سيجارة في اليوم؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
بتشرب خمر أو مخدرات؟ بطريقة منتظمة ولا في المناسبات؟ نوع الخمر إيه؟

Ask about number of cigarettes/day and duration + type of smoking (pipe, cigarette)

- **Smoking index** = No. Of Cigs/day X duration in years
 - **Mild** → < 100.
 - **Moderate** → 100 – 400.
 - **Heavy** → > 400.

• Calculating pack years of smoking:

20 cigarettes = 1 packet

Number of cigarettes smoked per day x number of years smoking / 20

For example:

A smoker of 10 cigarettes a day who has smoked for 15 years would have smoked:

$(10 \times 15) \div 20 = 7.5$ pack years.

- **Ex Smokers means** = he had stopped Smoking.
- ask your patient about shisha, Cannabis, Heroin or any Drugs.

► Hazards of Smoking :

Chest	C.V.s	G.I.T.	Other complications
- Chronic bronchitis, emphysema (COPD). - Bronchial asthma. - Bronchogenic Carcinoma - Post operative pneumonia.	- Arrhythmia. - Hypertension. - I.H.D. - Peripheral vascular disease.	- Peptic ulcer. - Cancer lip and tongue. - Cancer esophagus - Cancer stomach.	- Cerebro- Vascular Stroke. - Cancer bladder. - Tobacco amblyopia. - Intra uterine growth retardation (in smoker Pregnant Woman)

► Alcohol :

Ask about the amount / day.

10 gm alcohol = 30 ml of whisky = 100 ml wine = 250 ml beer.

Excessive alcohol intake:

Male consumes > 21 unit / week & female consumes > 14 unit /week.

► Hazards of Alcohol :

GIT	CNS	CVS
- Mallory-weiss syndrome - Alcoholic fatty liver - Alcoholic hepatitis then cirrhosis. - Acute hemorrhagic pancreatitis.	Wernicke's - Korsakoff syndrome (Ophthalmoplegia + ataxia+Confusion +amnesia + confabulation). - Polyneuropathy. - Proximal myopathy. - Optic atrophy. - Hallucination - delirium and coma.	cardiomyopathy

► N.B.

Familial tremors are Improved in small amount of alcohol

Please Write Personal History in a single paragraph as:

Male Patient X X X , 45 year old , driver, born in Zagazig but he is living now in Abbasia Cairo, Married 20 Years ago and has 3 living offsprings , the youngest one is 3 year old , he is a cigarette smoker, 20 cigarette / day for 15 years and there is no other special habits of medical importance.

► Menstrual History :

In female added as a part of personal history:

- Date of Menarche and menopause.
- Menstrual cycle (rhythm, length, duration of the flow, amount and color).
- Dysmenorrhea.
- Contraception (current use) .
- Example :** Her menarche at age of 13, 4 days of moderate amount of bleeding every 28 days without use of Contraceptive pills and no dysmenorrhea.

► N.B. In neurological sheet add handedness to personal history

► Complaint: C/O + Duration

إيه اللي جابك المستشفى؟؟

- By the patient own words; No medical terms.
- As short as possible (one complaint is enough).
- Don't get confused by the patient words, take the most recent and agonizing complaint

Example: the patient is complaining of shortness of breathing of 1 week duration

► History of present illness (H.P.I):

- Analysis of complaint.
- Symptoms of the related system. (If present)
- Systemic Review.
- Investigation & treatment (related diseases).
- Diabetes Mellitus and Hypertension (if present).

HPI should be:

- As long as possible and Contains medical terms.
- In chronological arrangement.
- In the form of a story.

Analysis Of The Complaint:

For analysis of any complaint in chest as usual (8) + 3 variants + 3 for any excreta. & if not present: No

8 as usual:

- Onset - course - duration. ؟ أو بتحدث في نوبات ؟
- Association. هل كانت مصحوبة بحاجة وتذكر الأعراض الثانية التي ممكن تكون موجودة ؟
- What increase and what decrease. إيه اللي بيؤود العَرَض ده ؟ وإيه اللي بيقلله ؟
- Effect of treatment. تأثير العلاج عليه ؟؟ هل لما بتأخذ العلاج الأعراض بتقل ولا بتفضل زي ما هي ؟
- Date of last attack. أخر مرة جالك العَرَض " وتقول إسم العرض ده " كان إمتى ؟

+ 3 variants

- Postural. عندك بلغم بيزيد في وضع معين ؟
- Diurnal. العَرَض ده بيزيد في النهار ولا ليل ؟
- Seasonal. بيزيد أو بيقل صيف ولا شتاء ؟ ربيع ولا خريف ؟

+ 3 for any excreta:

- Amount.
- Content - Color - Consistency.
- Odour.

+ 3 for any pain:

- Site
- Character
- Radiation

► Past history:

Disease	Operative	Drugs
• D.M. (if -ve) • Hypertension. (if -ve) • T.B. • I.H.D.	• Date. • Site. • Outcome. • Blood transfusion.	Drugs of chronic use as: • Long acting penicillin (Rh. F). • Corticosteroid. • Contraceptive pills. • Anti T.B. • Anti hypertensive.

Talk about the following in any disease in the past history:

Duration, Manifested, Investigated. Treated & Complicated or not

► Family History:

حد في العائلة اشتكى من نفس الشكوى ؟؟ الأب والأم قرايب ؟؟

- Consanguinity.
- Similar conditions.
- Chronic diseases: - DM / hypertension / TB / IHD.
- If not present: write irrelevant

► Socioeconomical state:

- **High social class:** Hypertension - I.H.D - irritable bowel disease
- **Low social class:** malnutrition - infections.



Don't Rush to examination before making a really good history, Always remember;

GOOD DOCTOR....

GOOD HISTORY...

GENERAL EXAMINATION

1. Vital Signs:

1. Pulse
2. Temperature
3. Blood Pressure
4. Respiratory rate

2. General Overview:

1. Appearance & Attachment as canula, catheter & ECG monitor .. etc
2. Built
3. Consciousness
4. Decubitus
5. Facial Expression

3. Regions:

1. Head & face examination
2. Neck Examination
3. Upper Limb Examination
4. Lower Limb Examination
5. Back

4. Other Systems Except that of local examination**Other method for General Examination:**

- A** **أرقام Vitals:**
- pulse
 - Blood pressure
 - Respiratory rate
 - Temperature.
- B** **Built:** Over built, average built or under built
- C** **Complexion:** pallor, jaundice and cyanosis:
- D** **Decubitus or position** see pictures later in inspection section
- E** **Neck vein (H & N)**
Clubbing (upper limb) & Flapping tremors in respiratory failure (CO2 retention)
Lower limb edema (lower limb)
- F** **فكر Mentality, Face + general look.**

Pulse

Definition:

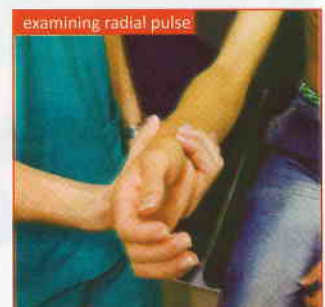
A pressure wave transmitted from ventricular ejection of blood to be palpated in superficial artery against bone

Manuver of examining radial pulse (most commonly used):

Encircling the wrist & palpating the radial artery by the middle 3 fingers (index & ring fingers for slight compression & the middle finger for palpation). the artery is between the radial styloid process and the tendon of flexor carpi radialis. make sure that the patient elbow is semiflexed to avoid stretch of the brachial artery by the fascia in the cubital fossa.

Comment on:

1. Rate
2. Rhythm
3. Volume
4. Equality (in volume) on both sides.
5. Special character.
6. Condition of the blood vessels
7. Peripheral pulsations.
8. Force.
9. Tension.



1. Rate:

Ideally count rate in one minute, if pulse is regular you may count in 30 sec. and multiply by 2, or in 15 sec. and multiply by 4.

Normal HR: 60 - 100 beat / min under complete physical & mental rest.

Tachycardia: (Rate > 100 / min)

Bradycardia: (Rate < 60 /min.)

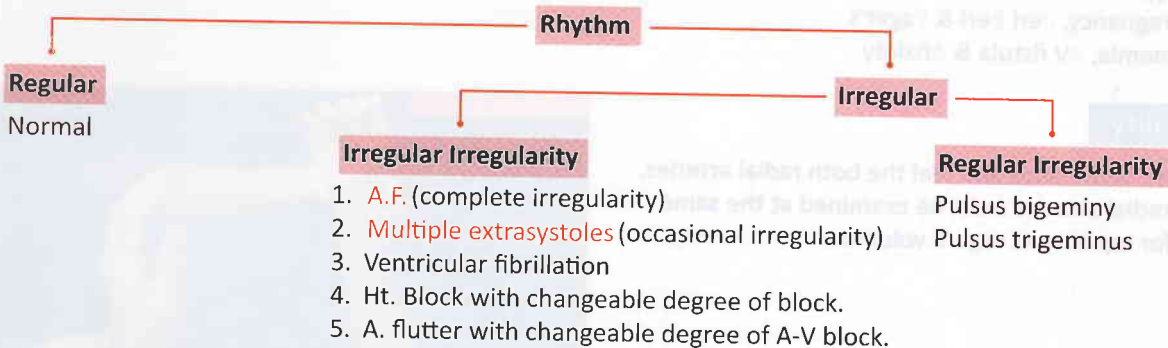
► N.B.

Examine pulse in the following order:

Rhythm >> Rate >> Volume >> Equality >> Special characters >> Vessel wall >> Peripheral pulse.

2. Rhythm:

Examine rhythm before rate if regular count in 15 or 30 sec. if irregular you must count in complete minute.



	Extra systole (with S. tachycardia)	Atrial Fibrillation
Pulse		
Rhythm	Occasional irregularity	marked irregularity (I can't count 4 or 5 regular successive beats)
Rate	According to sinus	usually rapid e.g. 100- 150/min
Carotid massage		slowing of pulse
Exercise	May Decrease irregularity	increased irregularity
Pulse deficit (see below)	<10 beats/min	>10 beats/min
Res. sinus rhythm	Positive	negative
Neck veins		
A wave	Normal with	Absent
V wave	Occasional irregularity	Systolic expansion
Heart sound		
S1	Normal with Occasional irregularity	Variability
ECG		
P	Premature beat followed by compensatory pause	Absent
QRS		markedly irregular

► N.B.

Slow AF may occur in treatment with digitalis, Beta blockers, associated Heart block or lone AF

3. Volume:

Pulse pressure (Volume or Amplitude) = Systolic blood pressure - Diastolic blood pressure e.g. 20 – 60 mmHg.
 Judged by the movement of the palpating finger produced by the arrival of the pulse wave.

Big pulse pressure:

- Pulse pressure > $\frac{1}{2}$ systolic blood pressure
- or **Pulse pressure > diastole**. Or roughly pulse pressure > 60 mmHg

Small Pulse volume	Big Pulse volume	Variable Pulse volume
• Small stroke v. (low COP) • Shock: Thready pulse; weak & rapid • Tachycardia	• A.I. - P.D.A. - AV fistula • Arteriosclerosis of the aorta • Bradycardia in C.H.B. • Hyperkinetic state (3H3P3A)	• A.F. • V. Tachycardia. • 3rd H.B. • Pulsus alternans

Hyperkinetic state:

4H: Hypoxia, Hyperthyroidism, Hepatic Failure & Hyperthermia

3B: Pregnancy, Beri Beri & Paget's

3A: Anemia, AV fistula & Anxiety

4. Equality:

Encircle both hands and feel the both radial arteries,
 Both radial arteries must be examined at the same
 time for equality as regard volume.

**Causes of unequal pulse:**

A. Compressing from outside	B. Causes in the arterial wall	C. Causes occluding the lumen
1. Cervical rib. 2. Cervical L. Ns. 3. Pancoast tumour	• Aortic arch aneurysm • Coarctation of the aorta (pre ductal) • Aneurysm of subclavian a. • Arteritis.	• Thrombosis. • Embolism.

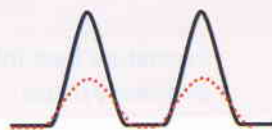
► N.B. (on request)

Unequal pulse rate occurs in one rare situation: pulsus alternans with decreasing volume in one side as
 pancost tumor

**5. Special character :****1. Water hammer pulse = collapsing pulse = bounding pulse :**

Sharp ascending and sharp descending with high
 amplitude
 best examined by raising the arm to decrease the
 diastolic BP and to maximise the gap between S & D
 while palpating the forearm by the palm.

Causes: the same causes of high pulse P. (see volume)

**2. Plateau pulse = pulsus tardus et parvus:**

slow ascending and slow descending with low
 amplitude.

Causes:

- A.S. (moderate or severe cases)
- B blockers therapy
- L.V.F.



3. Pulsus paradoxus:

Marked drop in the systolic pulse during inspiration (more than 10 mm Hg)

Causes:

- Pericardial:- tamponade, constrictive or effusion
- Severe congestive H.F.
- COPD (especially severe asthma)

Detection:

by Palpation (marked drop) or sphygmomanometry (mild drop) Measure B.P. during inspiration & during expiration.

► N.B.

Mechanism of Pulsus Paradoxus:

- It's a wrong term because it's an exaggeration of normal not a reversal of normal
- Normally during inspiration the lungs expand and accomodate more blood that decrease blood volume on left side → ↓ systolic blood pressure → ↓ pulse volume
- But also during inspiration venous return increases, some compansation occur and the net result is decreasing systolic BP and pulse volume < 10 mmHg
- If venous return is decreased pulsus paradoxus occurs

4. Pulsus deficit:

Search for Pulsus Deficit in irregular pulse HR on apex > radial pulse

Explain: Contraction of an empty ventricle (so some weak beats are unable to reach the radial artery).

Causes:

- A.F > 10 beats/m
- Extrasystoles < 10 beats / m.

You can't count 2 things at the same time, but 2 doctors can do pulsus deficit at the same minute, one counting apical pulse and the other counting radial pulse; the most acciptable tichnique is counting the difference between apical beats (S1) by stethoscope and radial beats.

Examining Pulsus Deficit



5. Pulsus bisferiens = bifid = double hump:

Best seen & felt at carotid artery

Causes:

- A.I. combined with A.S. (double A)
- Severe A.I.
- Hypertrophic obstructive cardiomyopathy

6. Pulsus alternans:

Alternation of strong & weak pulse waves with Equidistance, as volume is reduced in every other beat.

Causes: Severe L.V.F.

Mechanism: There's a difference in refractory period between healthy and diseased fibers.

Strong beat means all ventricle contracts, Weak beat means only healthy fibers contract

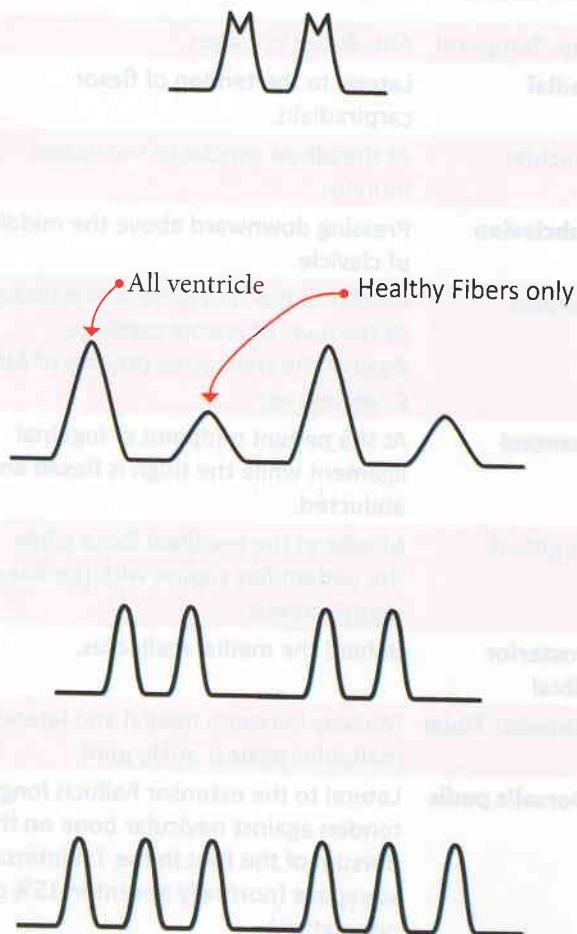
Detection: by palpation or by sphygmomanometer by counting pulse at time of high systole then counting again without using sphygmomanometer. If doubled means pulsus alternans

7. Pulsus bigeminus, Pulsus trigeminus & pulsus quadrigeminus:

Cardiac phenomenon characterized by groups of 2 beats close together followed by compensatory pause

Causes:

- Ventricular premature beats
- Digitalis toxicity
- Myocarditis
- Myocardial infarction



► N.B.

Unequal Carotid Pulsations:

- Atheroma of innominate artery or common carotid artery
- Aortic aneurysm or dissecting aneurysm

Special characters of pulse in aortic valve diseases:

- AS: Plateau pulse
- AR: water hammer pulse (Collapsing pulse)
- Double aorta: pulsus bisferiens

6. Vascular wall:**Rolling maneuver:**

distal and proximal occlusion of small segment of that artery by the index and ring fingers, rolling of the middle finger.

Osler's maneuver:

occlude the brachial a. by one hand (or by sphygmomanometer cuff) & palpate the radial a. by the other hand.

Result: Normally the arterial wall is not felt (or felt & elastic)

Causes of palpable arterial wall:

- Systemic atherosclerosis.
- Focal arteriosclerosis.
- Polyarteritis nodosa: grape like along course of the artery.

7. Peripheral vascular Pulsations:

Other peripheral arterial pulsations & capillary pulsation

Most commonly used one is dorsalis pedis artery (despite it's absent in 15% of normal population)

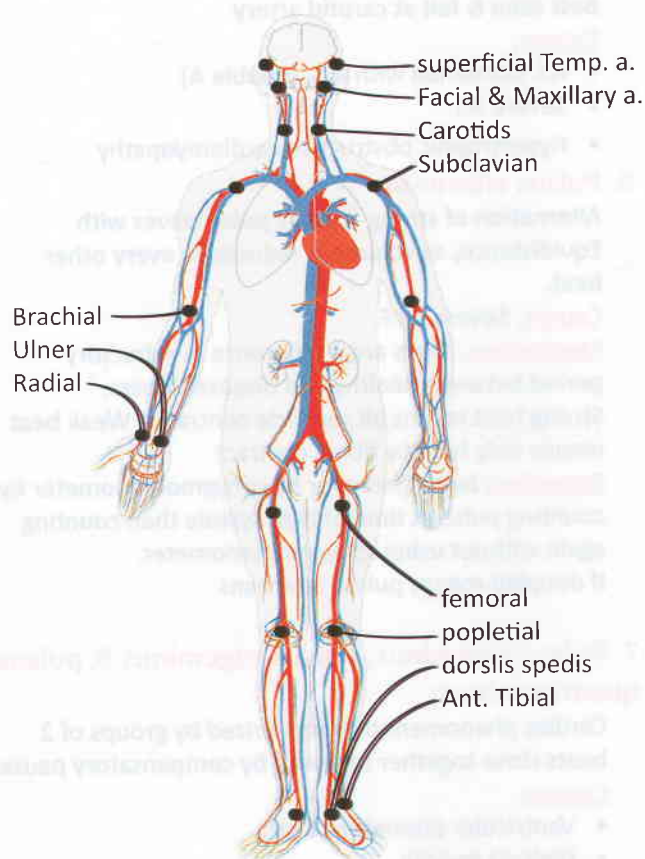
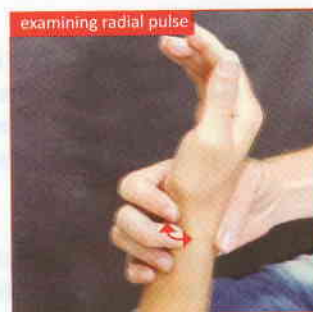
Body map for superficial arteries that can be used for pulse examination:

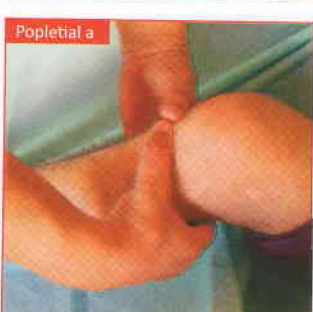
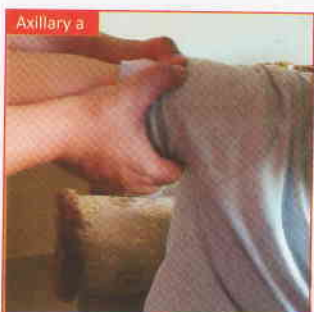
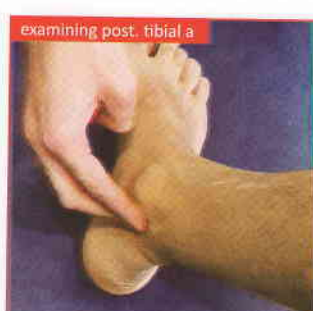
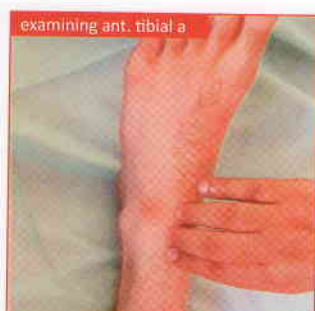
Sup. Temporal	Ant. & sup to tragus
Radial	Lateral to the tendon of flexor carpiradialis.
Brachial	At the elbow medial to the biceps tendon.
Subclavian	Pressing downward above the middle of clavicle.
Carotid	Medial to the sternomastoid muscle At the level of cricoid cartilage Against the transverse process of 6th C. vertebrae.
Femoral	At the patient midpoint of inguinal ligament while the thigh is flexed and abducted.
Popliteal	Middle of the popliteal fossa while the patient lies supine with the knee slightly flexed.
Posterior tibial	Behind the medial malleolus.
Anterior Tibial	Midway between medial and lateral malloulus against ankle joint
Dorsalis pedis	Lateral to the extensor hallucis longus tendon against navicular bone on the dorsum of the foot. In the 1st interos-sus space (normally absent in 15% of population).

► N.B.

Causes of absent or decreased peripheral pulsation:

- Leriche's syndrome
 1. Claudication of the buttocks and thigh
 2. Absent or decreased femoral pulsations
 3. Impotence
- Coarctation of aorta
- Extensive atherosclerosis
- Peripheral embolism
- Thromboangitis obliterans (Burger's disease)





► N.B.

Force = Systolic Bp

Least pressure needed to **occlude** arterial pulsations

Tention = Diastolic Bp

Least pressure needed to **feel** arterial pulsations

► N.B.

Radio Femoral Delay

Means femoral artery is weaker and delayed than radial artery in cases of:

- Coarctation of aorta
- Saddle shaped embolus at bifurcation of aorta


Example of normal pulse:

patient pulse is regular, 75 beats / minute, average volume, equal in both sides, no special character, normal vascular wall & intact peripheral pulsations with no radiofemoral delay.

Example for aortic regurgitation:

patient pulse is regular, 75 beats / minute, big volume, equal in both sides, water hammer pulse, normal vascular wall & intact peripheral pulsations with no radiofemoral delay.

Example for AF:

Patient pulse is irregular 95 beats / minute, variable volume, equal in both sides, with pulse deficit > 10 beats / minute with intact peripheral pulsations and no radiofemoral delay

Temperature

Using Mercurial thermometer

Oral temp: Under the tongue with closed lips for 3 min

- **Normal:** 36.5 – 37.2 °C
- **False decrease:**
 - Mouth breathing.
 - Incomplete closure of mouth.
 - Putting thermometer for too short time.

Conitions in which we can't measure temperature orally:

Child, Convulsions, coma, dyspnea (mouth breather)
mentally retarded patient, persistent vomiting, painful oral ulcer, trismus of jaw

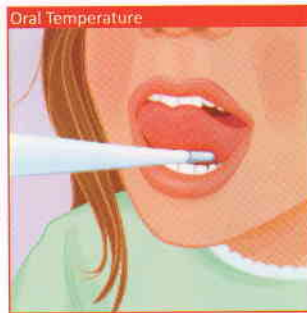
Rectal temp: Left for 2 min. (0.5 °C higher).

Axillary temp:

Put in axilla for 3 min. (1/2 °C Lower).

Terms:

- **Subnormal Temp.** < 36.5 °C.
- **Fever** > 37.2 °C.
 - Low grade ≤ 38.5
 - High grade > 38.5
- **Hypothermia** = ≤ 35 °C.
- **Hyperthermia** = > 41 °C.



► Types of fever :



- Continuous:** (Gram negative sepsis, CNS damage)
Fluctuation: $<1^{\circ}\text{C}$ & $>$ base line.
- Remittent:** (Viral, TB)
Fluctuation: $>1^{\circ}\text{C}$ & $>$ base line.
- Intermittent (Hectic):** (Abscess- malaria)
Fluctuation: $>1^{\circ}\text{C}$ & may reach the base line within hours
- Relapsing (cyclic, periodic):** (Collagenosis, lymphoma, brucellosis, IMN & FMF)
Days of fever and days of normal

► Temperature – Pulse relationship:

- Synchronization** between rise in body temperature and pulse rate documented as:
Each $\uparrow 1^{\circ}\text{C} \rightarrow \uparrow 10 - 15$ beats/m in HR
- Asynchronous** form:

Relative Tachycardia	Relative bradycardia
HR more than expected for body temperature as Myocarditis (Rh. F/Diphtheria).	HR less than expected for body temperature as typhoid F/ meningitis.

► Temperature – Respiration relationship:

Each $\uparrow 1^{\circ}\text{C} \rightarrow \uparrow 4$ cycle/m

Causes of Hypothermia:

- Hypothalamic lesion
- Myxedema
- shock
- Starvation

Causes of hyperthermia:

- Heat stroke
- thyrotoxicosis

Blood pressure

Introduction:

Factors affecting blood pressure:

Systolic	Diastolic
C.O.P (Lt. V. systolic P. & stroke volume).	- Peripheral resistance (vascular tone) & intact aortic valve. - Elasticity of Aorta. - Bl. Volume. - Bl. Viscosity.

Classification of blood pressure measurements:

Category	Systolic BP	Diastolic BP
• Optimal	< 120	< 80
• Normal	<130	< 85
• High normal	130-139	85 – 89
Hypertension		
• mild (Stage I)	140-159	90 – 99
• Moderate (Stage II)	160-179	100 – 109
• Severe(Stage III)	> = 180	> = 110
Isolated Systolic Hypertension		
• grade I	> 140-159	< 90
• grade II	> =160	< 90

For measurement of blood pressure you have to do:

1. Palpatory and auscultatory
2. Right and Left
3. Upper limb and Lowe limb
4. Laying flat and on standing

1. Palpatory and Auscultatory :

Palpatory method



Auscultatory method



Patient :

- Put the patient's arm at the same level of heart with the same level of sphygmomanometer
- Make sure that they do not have any tight clothing which may constrict their arm
- Under complete mental and physical rest

Apply blood pressure cuff:

- The bladder of the cuff should encircle 80% of the arm / not tight nor loose.
- The centre of the cuff bladder should be placed over the line of the brachial artery.
- Approximately 2 cm above the anticubital fold.

The doctor:

- Palpate the patient's radial pulse and inflate the cuff until you feel the exact point when the pulse disappears (estimated systolic pressure).
- Place the stethoscope over the brachial artery and inflate the cuff 30 mmHg above the estimated systolic pressure.
- Release the pressure slowly, no greater than 5 mmHg per second.
 - The level at which you consistently hear beats is the systolic pressure.
 - Continue to lower the pressure until the sounds disappear. This is the diastolic pressure.

Lastly: Remove the cuff.

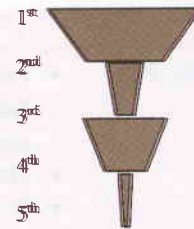
	Palpatory	Auscultatory
Advantage	avoidance of auscultatory gap.	Can detect Diastolic Bp
Disadvantage	can't detect diastolic B.P.	Presense Auscultatory Gap

Auscultatory Gap: (Silent gap)

Definition: Period during measuring blood pressure by auscultation in which no sound can be heard but blood passes and can be felt; Present with **unknown mechanism**, and some hypertensive patient leads to false measurement

Kortakoff phases:

- 1st sound heard.
- Sounds markedly decreased or may disappear (mistaken for D).
- Sounds reappear (mistaken for S).
- Sudden muffling of the sounds.
- Total disappearance of the sounds.

**2. Measure right and left :**

Normally there is a difference **less than 10 mmHg** between both sides
If **more than 10 mmHg**, that means unequal blood pressure (the same cause of **unequal pulse**)

3. upper limb and lower limb :

- Blood pressure in **lower limbs** > **blood pressure in upper limbs** by **less than 20 mmHg** which is normal and called "**Hills phenomena**" due to:
 - True increase: as arteries in lower limbs are in line with aorta.
 - False increase: as arteries in lower limbs are surrounded by bulky muscles,, so muscle need high pressure in bag to occlude the artery.
- If blood pressure in lower limb > blood pressure in upper limb by > **60 mmHg** it is called: "**Hills sign**" in AR.
- If blood pressure in lower limb < blood pressure in upper limb it is called: "**reversal of Hills**" and occur in coarctation of aorta.

Measurement of B.P In the LL:

- Pt. is lying in prone position.
- Apply the cuff around the lower 1/3 of the thigh above popliteal fossa.
- Auscultate (or palpate) popliteal artery.
- Continues as in U.L.

4. Measure blood pressure on laying flat and standing :

Measure blood pressure on supine position and then ask the patient to stand up and remeasure again after 1-2 minutes

- if Systolic Bp decreased > 20 mmHg or diastolic BP > 10 mmHg that means postural hypotension
- In postural hypotension (**orthostatic hypotension = orthostatic syncope**)
During Standing there is large fall in both systolic & diastolic B.P. (Normally there is a slight fall in systolic B. P. < 20 mm Hg and increase in diastolic B. P. < 10mmHg).

► Orthostatic Hypotension:

- Autonomic neuropathy, e.g. Diabetes.
- Sympatholytic drugs, e.g. ganglion blockers
- Lumbar sympathectomy.
- Hyponatremia.
- Prolonged recumbency.
- Elderly patient.
- Huge varicose veins.
- Hypovolaemia. e.g.: Haemorrhage or dehydration.
- Weakness of the muscles of the lower limbs (muscle pump).

► N.B.**B.P. in obese arm :**

- Use wider cuff that can encircle the arm completely, or
- The cuff wrapped around the upper 1/3 of the forearm & diaphragm of stethoscope is positioned over the radial artery.



Aneroid



Mercurial



Electronic

Types of sphygmomanometer:

- Mercurial: old but accurate
- Aneroid: no fluids, may be used
- Electronic (Digital): recent but less accurate

Uses of sphygmomanometer:

1. B.P. & pulse changes:

- Measurement of B.P.
- Determination of pulse pressure (S—D)
- Detection of pulsus alternans: if pressure is between weak beat & strong beat the radial pulse will drop by half as, the weak beats will be abolished.
- Detection of **pulsus paradoxus**: systolic B. P. will drop during inspiration (more than 10 mm Hg.)
- Detection of inequality of pulse in both sides (different blood pressure in Rt. & Lt limb).

2. In some valvular disorders:

- In **coarctation of aorta**: B.P. in arms more than B.P. in legs by more than 60 mm Hg (reversal of Hill's).
- In **A.I.** : B.P. in leg is more than B.P. in arm by more than 60 mm by (Hill's sign)

3. Diagnostic tests:

- **Capillary fragility test (Hess test)**
- **DVT**: application of low pressure will cause severe pain in diseased leg
- **Diagnosis of tetany**: Trousseau's test (carpopedal spasm).
- **Walker's test** for diagnosis of Myasthenia gravis.

4. Others:

- Tourniquet in venesection.
- Haemostasis.

Respiratory rate

Resp. rate: 12 – 20 cycles/min

Count respiratory rate while you are simulating counting pulse to **distract your patient**

Type:

- **Male**: abdomino thoracic
- **Female**: thoraco abdominal

For more details see chest

Built



Over built



average built



under built



Dwarfism

Determined by noting the weight and height in relation to: Age & Sex.

• Height

- **Dwarf** (stunted growth): as in
 - Familial
 - Congenital cyanotic Heart Diseases:- **Fallot tetralogy**.
 - other details in endocrinology
- **Tall**: as in
 - **Marfan's syndrome** (tall, arachnodactyly, pes cavus, high arched palate, ectopic lens, up ward subluxation of lens and A.I.)
 - Other details in endocrinology



thumb test in Marfan's S



► **N.B.**

Built is usually by just inspection without measurement while weight is by measurement

• **Weight**

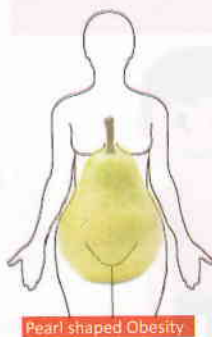
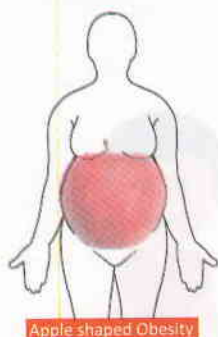
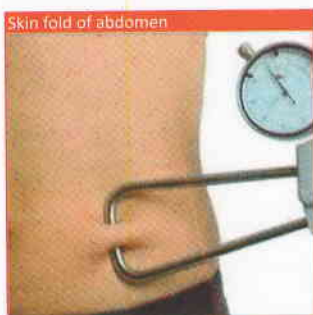
It can be determined by

1. body mass index (BMI): which is derived from the formula $Wt (Kg) / Ht (m^2)$

- **Normally** it is "18-25 Kg/M^2 " (average Weight).
- **Under built:** < 18.
- **Overbuilt:** 25-29.
- **Obesity:** 30-39.
 - Class 1 (30-35)
 - class 2 (35 - 40)
- **Morbid obesity:** 40 or more.

2. Obesity can be assessed by the thickness of skin folds e.g.,

- Lateral aspect of the arm 0.9 – 1.1 cm.
- Abdomen = 1.5 cm.
- Buttocks = 1.5-2.5 cm.

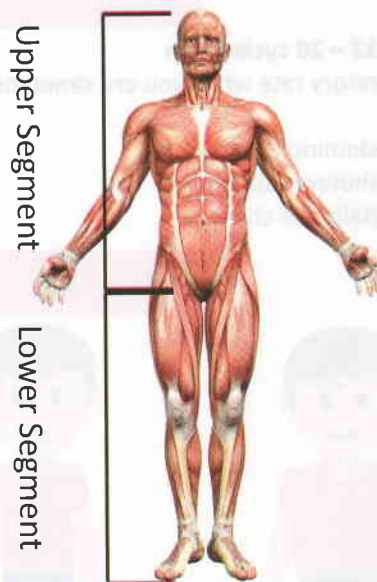


3. Waist / hip ratio (in male <0.95 in female <0.85)

Apple shaped persons with a greater waist-hip ratio have an increased risk of cardiovascular disease

Feature

- **The height and span are almost equal.**
 - **Height:** distance from the occiput to the heels in upright position.
 - **Span:** distance between the tip of the fingers with outstretched hands.
- **Lower and upper segments are usually equal**
 - L. segment = distance between symphysis pubis and floor
 - U. segment = distance between occiput and symphysis pubis



Complexion (colors)

Pallor, Jaundice, Cyanosis, Pigmentations & Skin rashes

► **Pallor :**

Definition: Difficiency of colour or decrease visibility of oxyhemoglobin.

Site of examination:

1. **Inner aspect of lips** (pull the lower lip outward gently)
2. **Tongue**
3. **Skin of the face.**
4. **Nails.**
5. **Palm creases.**
6. **Conjunctiva**

Never examine pallor in Conjunctiva because of endemic trachoma in Egypt that healed by cicatrization

► **N.B.**

- The degree of pallor depends on the state of capillaries, amount of blood within the capillaries, Hb, pigmentation & thickness of the skin.
- Examination of the mucous membranes may help to distinguish pallor of anemia from that of other causes.

Pallor in face



Pallor in nails



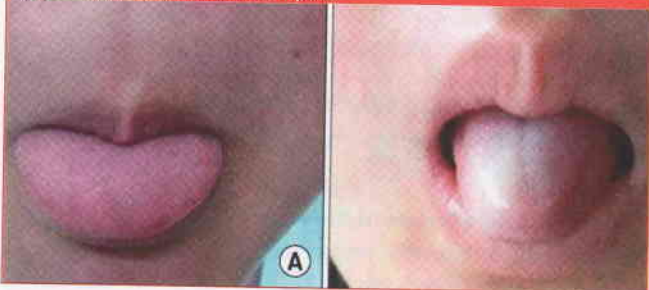
Pallor in hand



Pallor in conjunctiva



Pallor in tongue compared to a healthy one



► Q: Causes of pallor?

- Anemia
- Causes of pallor with normal CBC:
 - Shock or ↓ COP.
 - Toxemia e.g. infective endocarditis.
 - Edema of the face e.g. nephrotic syndrome.
 - Racial pallor (Far East).
 - Albinism
 - Myxedema
 - Lymphedema

► Jaundice :

Def.: yellow discoloration of skin & mucous membranes due to increase level of bilirubin > 2.5 mg %.

Sub clinical Jaundice: Serum bilirubin = 1- 2.5 mg/dl.

Site of examination: In sclera of lower fornix in the day light & soft palate

(why sclera?): Because sclera is elastic tissue that has high affinity to bilirubin

Unilateral Jaundice: jaundice in a patient with one artificial Eye & it may be an unusual finding 😊

Types:

1. **Hepatocellular J** :- e.g.:- Viral hepatitis, cirrhosis: Orange yellow ± L.C. F. Manifestations Liver is enlarged & tender, later it may become firm and shrunken.
2. **Hemolytic J.**: Lemon yellow J. ± pallor
3. **Obstruction J.**: Olive green J. + pruritus, bradycardia & frothy urine.

For more details see hepatology

► N.B.:

- It is best appreciated in fair-skinned individuals in natural daylight.
- Jaundice should not be confused with carotenemia, which also causes a yellow discoloration of the skin, but the sclera remain white.
- During the examination, expose the sclera by gently holding down the lower lid and asking the patient to look upward. It is important that the examiner consider the possibility that in patients with black or brown skin, hyperpigmented areas on the sclera are often nonpathological and are associated with the presence of melanin in the tissue of the sclera.

Hypercarotinaemia



Jaundice in the face



Unusual Unilateral Jaundice



DD of yellow discoloration of skin & sclera:

- Racial in nigros
- Atebrin
- Hypercarotinaemia (not in sclera)
- Picric a. toxicity
- Uraemia & Myxoedema
- xanthomatosis.

► Cyanosis :

Definition:

it is bluish discolouration of skin & m.ms, due to presence of more than **5 gm %** reduced Hb.

Cyanosis is aggravated with ploycythaemia.

Site of exam:

- tongue, lips, hands; nails.
- Examination in **daylight** is essential.

Types:

1. Central.
2. Peripheral.
3. Chemical (False)
4. Differential

1. Central cyanosis		2. Peripheral cyanosis
Blood ejected from heart (or lung) already contains more than 5gm% reduced Hb (hypoxic hypoxia)		Blood ejected from heart is normal (normal amount of reduced Hb (stagnant hypoxia)
Causes		
Cyanotic lung disease : • Asphyxia. • High altitude. • Pulmonary A-V fistula. • Lung diseases:- COPD, fibrosis, collapse, Massive consolidation, Pneumothorax or Pulmonary embolism Cardiovascular system : • Fallot's tetralogy • Eisenminger's (right to left shunt) Ploycythaemia (increase reduced haemoglobin)		Generalized decreased blood Flow : • Polycythaemia: increased viscosity. • Marked decrease in C.O.P. • systemic venous congestion : (RVF& cardiac Tamponade) • Shock Localized decrease in blood flow : • Cold temp. • Peripheral circulation disturbance (Raynaud's, Burger's, venous thrombosis & Arterial occlusion)
examination		
Site	All the body: Skin, conjunctiva, inner lips & tongue (and as in peripheral)	Skin of peripheral parts: Tip of fingers, hands, tip of nose, ears, outer lips (Tongue is normal)
Hand	Warm (peripheral V.D.)	Cold (peripheral V.C.)
Warming	No effect	Cyanosis improved
Oxygen	Improves cyanosis (in pulmonary causes only)	No effect
PO2	Decreased arterial and venocapillary blood	Decreased in venocapillary but normal in arterial blood
Clubbing	±	-ve
Ploycythaemia	+ (hypoxia stimulate erythropoiesis)	-ve

► N.B.:

• Why Tongue?

- Has no autonomic (VC) fibers
- Highly vascular
- Continuous exercise
- Warm site

• Blue tongue in peripheral cyanosis occur in:

- Lingual vien thrombosis
- SVC obstruction

• Normal Tongue in Central Cyanosis:

In differential cyanosis (see later)

• Examination of under surface of tongue is better than dorsum Due to:

- Presence of viens on the undersurface
- Presence of Papillae, Pigmentations or coat on the dorsum

• Central and Peripheral cyanosis occur in one disease: **Polycythemia:**

- Central: ↑ Reduced Haemoglobin relatively
- Peripheral: stagnation by slow circularion

• Never to diagnose anemia (marked pallor) and central cyanosis in the same patient

3. Chemical (False) cyanosis: Abnormal haemoglobin simulating reduced Hb & presented as central cyanosis & diagnosed only by spectroscopy

- Met-Hbaemia: cong. / nitrites
- Sulph-Hbaemia: sulphonamide treatment or bacteria

4. Differential central cyanosis: in the lower half of the body only:

- PDA with reversed shunt.
- PDA with coarctation of aorta (Preductal infantile aortic coarctation)

Cyanosis (Central & Peripheral)



Differential Cyanosis (Blue toes & normal fingers)



Pigmentations:

Causes of general pigmentation

- Familial / Racial.
- LCF.
- Addison's.
- RF
- Pellagra.
- Haemochromatosis.
- 1ry biliary cirrhosis
- Pituitary cushing

Localized pigmentation

- **Red:**
 - Malar rash in MS with PH++ due to:
 - Reflex VD
 - Compression of sympathetic chain by Lt. Atrium
 - Myxedema, Cushiong & Alcoholics
 - Discoid: spare nasolabial fold in SLE
- **Brown:**
 - Pellagra
 - Pregnancy (Chloasma Gravidarum)

► N.B.:

Blue sclera in:

- Familial
- Gong. Glucoma
- Osteogenesis imperfecta
- TB

Blue sclera



Malar rash



Chloasma Gravidarum



► Skin Rash :

- **Erythema marginatum:** redness of the skin or mucous membranes It is found primarily on extensor surfaces; associated with bradykinin has been proposed in the case of hereditary angioedema
- **Erythema nodosum:** an inflammatory condition characterised by inflammation of the fat cells under the skin, resulting in tender red nodules or lumps that are usually seen on both shins. resolves spontaneously
- **Erythema multiformis:** type of erythema follows an infection or drug exposure.
- **Spider Nevi:** and it's DD, See abdomen

Erythema Marginatum



Erythema Nodosum



Erythema Multiformis



Decubitus

Decubitus: Position of the patient in bed in relation to certain disease as Lat. Decubitus

Position: Position preferred by patient during sitting as squatting position

Attitude: Position taken by the patient on standing as flexion attitude.

Gait: Walk style of the patient as circumduction gait in hemiplegia

• **Orthopnea: Semi setting position**

- Heart: Lt. Sided H.F. & Pericardial effusion.
- Chest: Br. Asthma & Emphysema
- Increased intra abdominal pressure e.g. massive ascites & Marked obesity.

• **Platypnea:** dyspnea in the erect position relieved by recumbency In huge apical lung tumors or hepatopulmonary syndrome.

• **Trepopnea (Lateral Decubitus):** Patient prefer to lie on one side and dyspnea occur on the opposite side as in pleurisy or lung abscess

• **Squatting position:** In Falott's tetralogy to increase blood volume & BP to the most important areas (heart & brain) by squeezing on peripheral BV

• **The praying Muslim position (leaning forward position):** pericardial effusion, mediastinal syndrome & acute pancreatitis.

• **Opisthotonus:** (high arched back) meningitis, tetanus or strychnine poisoning.

• **Flexion attitude**

- Passive in abdominal colic.
- Or Rigid in peritonitis.
- Parkinsonism

Semising position



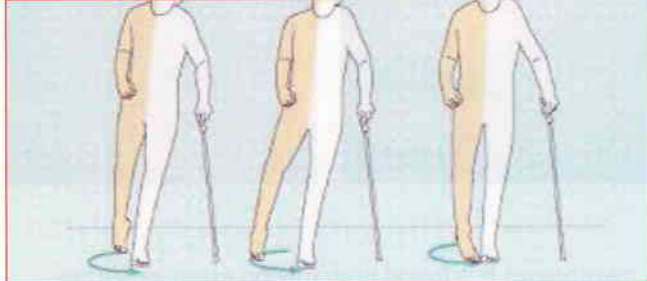
Leaning forward position



Squatting Position



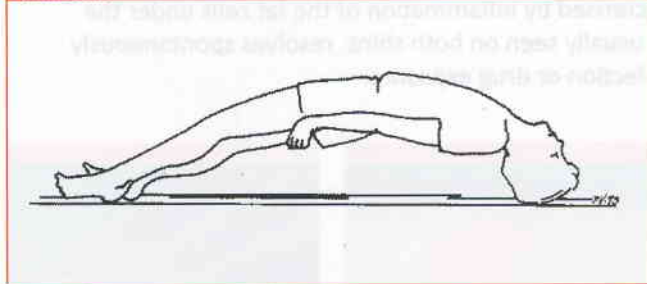
Circumduction gait



Flexion attitude



Opisthotonus



Neck Veins

Value: reflects pressure changes inside the right atrium as internal jugular vein is connected to Right atrium via Superior Vena Cava without any valves inbetween.
The venous pressure is measured most accurately by manometry.

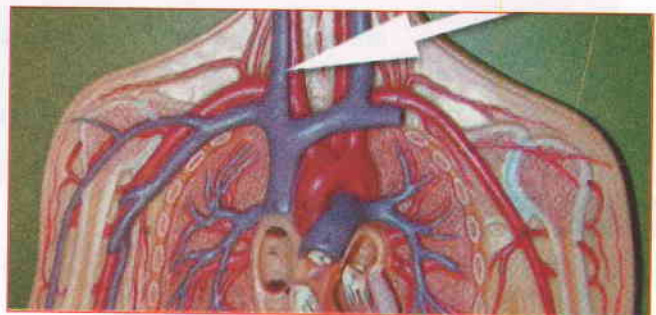
Internal jugular vein is preferred:

Internal jugular vein	External jugular vein
- Valvless - Dosen't pierce deep fascia of the neck. - Straight Course. - Straight line from the angle of the jaw to the medial end of the clavicle deep to sternomastoid & platysma muscles.	- may contain valves. - pierce deep fascia of the neck so easily occluded. - Tortous Course - Line drawn from angle of mandible to mid clavicular point
	

► N.B.

Right sided pulsations are preferred:

- Lt. Innominate vein (= brachiocephalic) may be compressed by the arch of the aorta leading to congestion of left Jugular.
- Right int. Jugular vein indirect continuation with the right atrium.



It is venous or arterial ?

	Venous	Arterial
Sternomastoid	Lower Lateral (L.L.) to sternomastoid in post. Triangle.	Medial & upper to sternomastoid in ant. Triangle.
Character	Better seen than felt	Better felt than seen
	Wavy: more than one wave Have an upper level	One wave has no upper level
	A Synchronise with heart beats.	Synchronise with heart beats.
Respiration	Changed with inspiration (emptying)	not affected.
Position	changed by position	not changed.
Pressure	obliterated by pressure.	not obliterated by pressure.
Hepato-jugular Reflux	+ve (increase Pressure)	no effect

► N.B.

Hepato Jugular Reflux = one minute abdominal Compression test.

mild pressure on liver or abdomen leads to elevation of upper level of vein and dosen't affect artery .

Comment on neck veins:

1. Waves (J.V. pulse).

2. Pressure (column elevation = congestion).

To know the relation between neck veins and cardiac cycle you have to remember at first cardiac cycle

S1	S2	S1
Systole 0.3 sec.	diastole 0.5 sec.	

1. Iso metric contraction phase.

2. Ejection phase.

1. Iso metric relaxation phase.

2. Passive filling 70%.

3. Atrial contraction 30 %.

Waves (Physiology)

- Consists of three positives (A, C and V) and two negatives (X and Y).
- The A wave is normally the highest wave.
- The X wave is usually deeper than the Y wave.
- Radial pulsation is preferred for timing of the venous pulsations.

Wave	Explained	Timing
A Wave	Atrial contraction.	Presystolic
C Wave	Elevation of the tricuspid valve at the start of ventricular contraction or / Transmitted pulsation of carotid artery.	
X (Systolic collapse)	Right atrial relaxation.	Systolic
V Wave	Accumulation of venous blood in the right atrium during ventricular systole.	Systolic
Y Wave: (70 %)	Descend of blood from atrium to ventricle passively.	Diastolic

Abnormalities of the waves

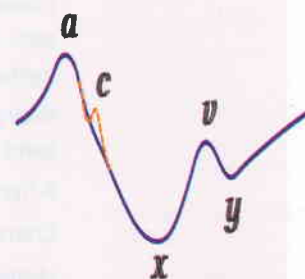
- A wave:**
 - Large or giant A waves: T.S. / P.S. PH++
 - Absent A: Atrial fibrillation.
 - Cannon A wave: Nodular rhythm /V. tachycardia / 3rd HB
- Prominent V wave (systolic expansion)**
 - T.R.
 - Right sided heart failure
 - AF.
 - Cannon waves

• Deep X:

- Pericardial effusion
- Constrictive Pericarditis.

• Deep Y:

- Pericardial Effusion
- Constrictive Pericarditis.



Pressure:

Definition:

it is the vertical height between the top of venous pulse & angle of Louis when the Pt. is lying at an angle of 45.

Measurement:

- The Pt. is positioned at about 45° to the horizontal plane with Good Lightening.
- The head is supported by a pillow & the neck is slightly flexed to allow the skin & muscles overlying the vein to relax, also the face is directed to the left side to relax sternomastoid.
- The jugular V. pressure is measured as "The vertical distance bet. the manubrio-sternal angle & the top of the venous column



Normal jugular venous pressure:

- The angle of Louis is about 5cm above Rt. A. at 45.

C.V.P. = J.V. pressure [----] + 5cm = [----] cm H₂O

- Normal jugular venous pressure not more than 2 cm H₂O.
- Normal pressure in Rt. A. (central venous pressure) less than 7 cm H₂O

Congested neck veins

1. Congested pulsating neck veins:

- Right sided heart failure.
- Tricuspid valve disease as T.I. & T.S.
- Pericardial (effusion - Constrictive pericarditis).
- Increased intrathoracic pressure (Massive pleural effusion \ Tension Pneumothorax / Emphysema).
- Increased intra-abdominal pressure (Tense ascites / Pregnancy / Huge abdominal swelling).
- Over transfusion = hypervolaemia
- Hyperdynamic circulation.

► N.B.

Neck vein & respiration:

- Insp. → emptying (normal).
- Insp. → no change
 - Congestive H.F. or,
 - S.V.C. obstruction.
- Insp. → filling in pericardial disease "Kausmaul's sign".
- Exp. → filling in emphysema.

2. Congested non pulsating neck veins:

- S.V.C. thrombosis causing complete obstruction.
- Mediastinal syndrome causing complete obstruction.
- Severe late constrictive pericarditis & pericardial effusion

► N.B.

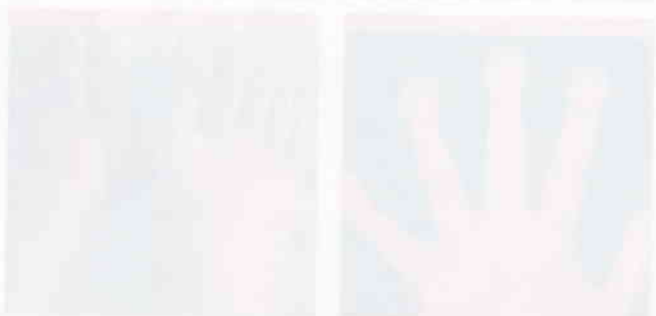
Any severe congestion may appear as congested non pulsating.

Examples to comment on neck veins:

1- if normal: non Congested neck veins with normal waves (Systolic collapse and normal inspiratory emptying).

CVP < 7 Cm water.

2- in AF : Congested pulsating neck viens with normal inspiratory emptying with systolic expansion (prominent V) and absent A wave. CVP > 7 Cm water.



Clubbing

Definition: Proliferation of soft tissues at nail beds & terminal phalanges due to Chronic toxemia, hypoxia, irritation or immune disease

Causes of clubbing:

	1. Pale (toxaemic) needs weeks to appear	2. Blue (hypoxic / cyanotic) needs months to appear
Cardiac	• Infective endocarditis. • Lt. atria Myxoma	• cong. cyanotic heart: Fallot's & Eisenminger's
Chest	• Suppurative lung S. • Bronchogenic carcinoma • Mesothelioma. • COPD (if associated with bronchiectasis or bronchogenic carcinoma) • Fibrinoid TB	Cyanotic lung diseases: • Interstitial pulmonary fibrosis
Abdominal	• Bilharzial polyposis • Cirrhosis especially 1ry biliary cirrhosis • Ulcerative colitis. • Crohn's Disease • Steatorrhoea	

3. Familial: 5% benign condition

4. Occupational: some fingers e.g. index & thumb (shoemakers & carpenter).

5. Thyroid Acropathy: occurs in 1% of patient of graves (Clubbing, Exophthalmos, pretibia myxedema)

6. Unilateral clubbing: causes of unequal pulse on both sides,

7. Differential clubbing (in L.L. only): causes of differential cyanosis

Causes of reversible clubbing:

(Empyema, mesothelioma & endocarditis).

Grades of clubbing:

- **Grade I:** obliteration of the angle between nail and nail bed (+ ve fluctuation test at nail base).
- **Grade II (parrot beak):** I + increase convexity of nails in its longitudinal curve.
- **Grade III (Drum stick):** I + II + hypertrophy of terminal phalanx.
- **Grade IV (hypertrophic osteoarthropathy):** III + "tender" Hypertrophy of distal ends of long bones at wrist & ankle due to periosteal irritation & new bone formation.

Examination:

- Look at fingers in profiles.
- **Window test** (Schamroth's window test: patient holds 2 index finger nails touching each together: if normal, will show a diamond-shaped window).
- **Fluctuation test** at the nail base as clubbing increases vascularity and act as a cystic swelling... see the picture below



DD of clubbing (causes of pseudo clubbing):

Definition: Over curvature of the nails in both longitudinal and transverse axes, with preservation of a normal nail bed angle

Causes:

- Chronic paronychia
- subangular hematoma
- chronic renal failure
- sarcoidosis & scleroderma

Oedema

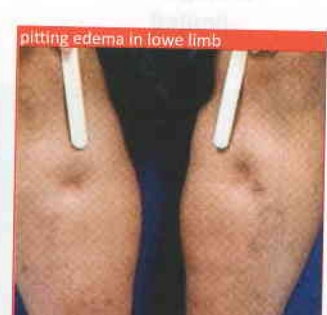
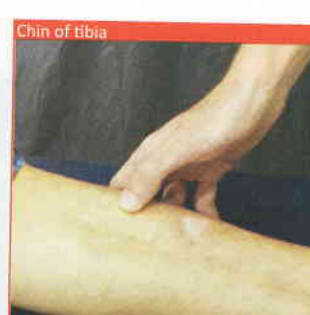
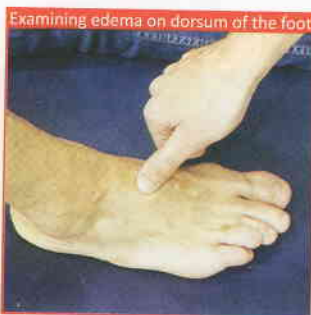
Definition: means abnormal accumulation of fluid in the interstitial tissue due to disturbed mechanisms of formation of interstitial fluid.

Comment on:

- Unilateral or bilateral (Unilateral: local diseases, Bilateral: systemic disease)
- Pitting or non pitting (Pitting if soft as heart failure or LCF, non pitting if hard as lymphedema & myxedema)
- level (extent) for example below knee or generalized ... etc
- Tenderness (painful in inflammation or obstruction as DVT; painless if just accumulation of fluid as LCF)
- Examination of serous membranes (Lower limb edema with ascites, pleural and pericardial effusion means Generalized edema).

Examination of oedema:

- **Below the knee** pressure for about ½ minute over bony prominence (Posterior to medial malleolus, dorsum of the foot and the chin of tibia)
- **Pinching** test over the thigh
- **Pedou-orange** over the anterior abdominal wall.
- Examine back for **sacral edema**.

**► D.D. of generalized edema :****1. Cardiac oedema:** with congested neck veins.

- **Bilateral.**
 - Unequal oedema occurs in case of deep venous thrombosis (DVT).
 - It may be on one side in Pts. preferring to sleep on one side.
- **Painless.**
- **Pitting.**
- **Dependant:** appears in the dependant parts of the body:
 - Ankle oedema: in ambulant Pt.
 - Sacral oedema: in recumbent (or bed ridden) Pt. (When oedema is very great; it may affect whole LL, genitalia, abdomen, chest and even the face "generalized anasarca")
- **Before ascites:** always L.L oedema precedes ascites except in 2 conditions where ascites precedes (ascites precox):
 - pericardial effusion & constrictive pericarditis.
 - T.R. or T.S. due to marked congestion of liver

Q : Pathogenesis of cardiac oedema ?

2. Renal oedema: Occurs firstly in eye lids, generalized, pitting marked in the morning.

Nephritic: in acute nephritis	Nephrotic:
• Oliguria • Hypertension (Na & water ret) • Haematuria • Epith & red casts in urine	• Heavy albuminuria • Hypoproteinaemia • Generalized oedema • increased cholesterol

3. Hepatic oedema: In advanced liver cirrhosis + other signs of L.C.F.

4. Nutritional oedema: + other signs of nutritional deficiencies.

- Sever malnutrition.
- Sever malabsorption.
- Sever anaemia.

5. Angioneurotic oedema: allergic.

- **Non pitting , Acute, Localized** (lips, eye lids, larynx) or **generalized**
- History of other allergic manifestation: eczema., asthma.
- Family history of allergy.
- Rapid response to anti allergic measures.

► Localized edema :

1. D.V.T.
2. **Lymphedema:** (non pitting) Filariasis - Post mastectomy.
3. **Varicose veins:** Mainly in L.L.+ signs of varicosities.
4. **Orthostatic edema:** Mainly in L.L + diurnal variation ± Occupational Factors
5. **Angioneurotic edema:** Affecting the face (lips) asymmetrically, with history of allergy. Of sudden onset, self limited

► N.B.:

- **Causes of edema in one UL or one L.L.:** DVT, cellulitis, lymphedema trauma
- **Drugs causing oedema** e.g. cortisone, pills, NSAID.
- **Non pitting edema** occurs in Lymphedema, myxoedema and Angioneurotic edema.
- **Occult Oedema:** Up to 3 liters of excess fluid may be retained in the interstitial tissue without apparent oedema Pitting oedema is usually demonstrated if accumulating exceeds this amount (3 liters).

Mentality & Appearance

Mentality: Consciousness, orientation (Time, Place and Person mood (emotional state), memory intelligence and behavior.

Appearance: Healthy, ill, toxic, cachectic, irritable, Depressed etc

► **Example:**

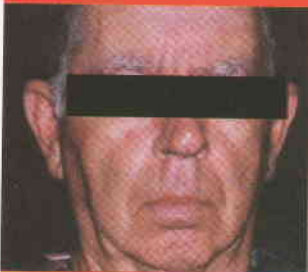
The patient is fully conscious, oriented with time, place & persons, emotionally stable with intact memory as regard near & far events of average intelligence & behaviour normally.

Regional Examination

Face Examination :

Specific facial appearance and expressions can diagnose certain diseases from the first Look.

Parkinsonism:
Mask like face



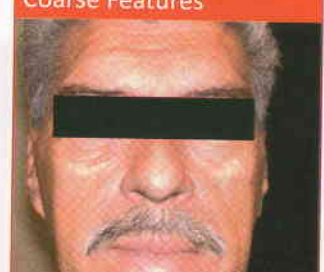
Myxoedema:
Apathetic look



Hyperthyroidism:
Restlessness, Staring look



Acromegaly:
Coarse Features



Cushing's:
Moon face



Myasthenia Graves:
Weak smile, bilat. Ptosis



Down: Mongoloid face +
Low setted ear



Thalassemia
Mongoloid face + see NB



Facial Palsy



- **Toxic look:** Infective endocarditis
- **Mitral face (malar flush):** peripheral cyanosis of cheeks (low C.O), Dilated capillaries, lips may be cyanosed.
- **Tricuspid face:** tinge of jaundice + peripheral cyanosis of the lips.
- **Congenital syphilis:** Square like bulldog
- **Uremia:** Earthy look
- **Horner's syndrome:** See neuro
- **Myopathic face:** Expressionless, protruded lower lip

► **NB: Mongoloid face:**

- **Down Syndrome:** + epicanthal fold, flat philtrum, Low setted ear & thin upper lip
- **Thalassemia.**

Head Examination:**Skull :**

- Large Skull in acromegaly and chronic Hemolytic anemia.
- Hydrocephalus and **Paget's**.
- Microcephaly and craniostenosis.
- Enlarged supraorbital ridges: **acromegally** (frontal sinuses)
- Tender temporal artery: **Giant cell arteritis**.
- Bruit: on intracranial arteriovenous malformation or big cerebral aneurysm.
- hair and its pattern of distribution as silky hair in LCF.

Eye :**1. Eyebrow:** Loss of hair in outer 1/3 of eyebrow:

(See page 32 picture E3)

- Myxedema.
- Leprosy.
- Familial
- Artificial (the commonest)

2. Eye ball.

Exophthalmos	Enophthalmos (sunken eye)
• Thyrotoxicosis • cavernous sinus (pulsatile) • leukaemic deposits behind eye ball • Congenital	• Dehydration • Horner's syndrome

3. Eye Lids. (See page 33 picture E1&6)

Ptosis	Oedema and puffy eye lids
• Congenital. • Hysterical. • Mechanical. • Oculomotor nerve paralysis • Myasthenia gravis • Ectropion, Entropion • Blepharospasm	• Chronic cough. • Renal, nephrotic or nephritic • Myxoedema . • Lack of sleep or excessive sleep • Angioneurotic • Rarely as a part of generalized oedema (HF / LCF)

4. Sclera.

- Blue Sclera
- Jaundice

5. Cornea (See page 32 picture E4&5)

- **Arcus senilis** in senile patients and young with hyperlipidaemia
- Opacities due to trauma or infection.
- **Kayser Fleisher ring** Wilson's disease.

6. pupil

- **Irregular:** Argyll Robertson pupil
- **Miotic:** Horner's syndrome
- **Mydriatic:** 3rd cr. N. paralysis / opiate / atropin

7. Conjunctiva:

- **Pallor:** conjunctiva is not reliable to diagnose pallor.
- **Sub conjunctival hemorrhage:** as in
 - hemorrhagic blood disease
 - cough
 - Infective endocarditis (Micro-embolization)
 It usually has an upper limit to be differentiated from conjunctival congestion.
- **Conjunctivitis:** C/P: photophobia, lacrimation and a sticky discharge).
- **Vitamin deficiency:** as Xerosis (Vit .A), Vascularization (Vit.B2).
- **Pterygium** patch of progressive fibrosis may encroach upon the cornea.

8. Lens:

- **Cataract** occurs in:
 - Diabetes mellitus .
 - Mongolism
 - Myotonia atrophica.
 - Cretinism.
 - Scleroderma
 - Hyperparathyroidism
- **Ectopic lens:** in Marfan's syndrome

► N.B.**Rubella:**

stigmas indicating maternal rubella infection:

1. Cataract
2. Mental defect
3. Nerve deafness
4. Associated with cardiac (PDA or P.S.)

9. Iris and ocular tension:

- **Iritis** is often a manifestation of systemic disease e.g. ankylosing spondylitis and Behcet's disease.
- **The ocular tension** can be tested digitally, it is tested in patients with headache and diminished visual acuity.

10. Xanthelasma: (See page 32 picture E2)

It is a yellow eruption at inner side of the eyelids and peri-orbital skin associated with hypercholesterolaemia.



11. Fundus examination:**Nowdays it is one of general examination.**

- **Optic neuritis** and its causes as Multiple Sclerosis and ethambutol.
- **Papilledema** and its cause as Brain Tumors.
- **Diabetes M** (Non proliferative and proliferative Retinopathy)
- **Hypertensive retinopathy :**
- **Grade I:** mild sclerosis (narrowing) of retinal arteries
- **Grade II:** Moderate to marked sclerosis with compression of veins at crossing
- **Grade III:** flame like hges + fluffy cotton exudates
- **Grade IV:** Papilledema + as in III
- **Infective endocarditis**
- Central retinal art. Occlusion by embolism.
- Central spots: (due to vasculitis).
- Roth's spots. "Central pale spot surrounded by hyperemic ring caused by micro-embolization.
- **SLE:** hard exudates = cytooid bodies / hges.
- **Capillary pulsations** in A.R.

Nose and Ear :

- Redness of the tip of nose : alcoholism .
- Depressed nasal bridge (**saddle nose**) (See page 32 picture N1) : congenital S, traumatic or congenital or Wegner's granuloma.
- Working ala nasi: - pneumonia or nervousness.
- Sulfur granules: B2 deficiency.
- Large nose: congenital - acromegaly
- gouty tophi on helix, discharge chalky materials
- F.B in the external meatus
- Spider nevi
- Large ears: congenital, acromegaly & myxoedema.

Cheeks :

- **Pale:** anemia
- **Red:** S.L.E & Cushing disease.
- **Malar flush:** M.S.
- **Brownish pigmentation:** pellagra.

Lips :

- **Cheilitis:** painful vertical fissures mainly of lower lip caused by malnutrition or with Crohn's disease.
- **Angular stomatitis** (angular cheilosis) also in Vit.B2 and Iron deficiency, also caused by candida .
- **Pallor, cyanosis** (See complexion)
- **Angioedema, herpes labialis.** (See page 32 picture M1)

Teeth :

- Discoloration: Tobacco, poor hygiene, lead poisoning
- Loosing of teeth: D.M.
- Wide spacing: (See page 32 picture M4) Acromegaly.
- Notched: (See page 32 picture M5) congenital syphilis (Hutchinson's teeth)
- Dental caries, tooth extraction.

Gum :

- **Bleeding:** Vitamin C deficiency, thrombocytopenia, chronic liver disease.
- **Hypertrophy:** Epanutin, monocytic leukemia.
- **Blue line:** lead poisoning.

Tongue :

The surface of the tongue normally varies as regard colour and appearance.

1. Color:

- **Black:** iron therapy , Addison's.
- **Brown:** smoking.
- **Blue:** cyanosis.
- **Pale:** anemia.

2. Atrophy: (Glazed red tongue) (See page 32 picture T3)

- With iron deficiency anaemia,
- Hypovitaminosis e.g.: B12 , pellagra.

3. Leucoplakia: (See page 32 picture T7)

- Due to chronic irritation, it is precancerous.

4. Moisture: (See page 32 picture T5)

- Dry tongue (under surface) = dehydration.

5. Strawberry tongue: (See page 32 picture T4) Scarlet fever.**6. Macroglossia:** (See page 32 picture T1)

- Myxoedema
- Acromegaly
- Amyloidosis
- hemangioma
- Pseudomacroglossia: Down
- Oedema: Angioneurotic

7. Neurological ex.

- **Tremors of the tongue**
- Thyrotoxicosis.
- Parkinsonism.
- Essential familial tremors.
- **Percussion or tapping for:** Fasciculation, Myotonia.
- **Crània nerve** For 5th \ 7th \ 9th \ 12th.

8. Scrotal or fissured tongue (See page 32 picture T6)

- Down syndrome and acromegaly.

9. white coated: typhoid F**10. Ptyalism (increased salivation)**

- Neurosis
- Stomatitis
- Reflex from GIT diseases.

Buccal mucosa, palate, tonsils and pharynx :**1. Buccal mucosa:**

- Pigmentation (Addison's disease)
- Aphthus:- ulcers on the inner sides of the lips, the edge of the tongue and the inside of the cheek
- Koplik's spots

2. Tonsillitis and pharyngitis**3. Palate:**

- Jaundice appears early in the soft palate.
- petechial spots in thrombocytopenic purpura and leukemia.
- Pin point petechial spots also in infectious mononucleosis.
- High arched palate or cleft palate in congenital conditions. (See page 32 picture M6)
- Palatal movement, palatal & pharyngeal reflexes.

4. Breath:

- Aceton: diabetic ketoacidosis
- Ammonical: uremia
- Foetor hepaticus: hepatic failure
- Foiled smell: suppurative lung disease (Halitosis)
- Other causes of halitosis: Bad oral hygiene, Sinusitis, Tonsillitis or Dyspepsia

Parotid enlargement :

(See page 32 picture M2&3)

- Mumps
- Sarcoidosis
- Cirrhosis
- Endemic parotitis
- Stones or Tumor
- Hypoproteinaemia.
- Sjogren syndrome.

Neck Examination :

1. General ex.

- Look for scars, lumps, rashes, hair loss, or other lesions.
- Look for facial asymmetry, involuntary movements, or edema.
- Palpate to identify any areas of tenderness or deformity.

2. Pulsation: Arterial & venous. (See latter)

3. Thyroid enlargement: (see latter)

4. L.N.: (see latter)

5. Torticollis: Hysterical, myositis of sternomastoid

6. Rigidity: Meningeal irritation & cervical spondylosis

7. Trachea: See the chest.

8. Supra sternal pulsations: (see latter)

9. Neuromuscular examination of head and neck: see neurology

10. Special Tests:

- Facial Tenderness
- Sinus Transillumination
- Temporomandibular Joint.

► N.B.

Causes of ↑ carotid pulsation (causes of suprasternal pulsations:

- A.R.
- Hyperdynamic circulation states e.g. Thyrotoxicosis
- Carotid aneurysm.
- After exercise or anxiety in thin persons.

Other Anatomical disorders

Congenital abnormalities (e.g. high arched palate, webbing of neck & fingers & toes, pectus carinatum or pectus excavatum, arachnodactyly or polydactyly, pes cavus or flat foot, telangiectasia, neurofibromatosis)

Marfan's Syndrome

1. Head and Neck

- Ectopic lens ± cataract
- High arched palate.

2. Extremities

- Thin and Long finger (arachnodactyly)
- encircling test
- Flat foot or pes cavus.

3. Chest

- Pectus excavatum or pectus carinatum
- Kyphoscoliosis.
- Associated Ht. Lesions:
- Dissecting Aneurysm of aorta \ A.R. \ A coarctation
- Mitral valve prolapse M.I.,
- AV bundle conduction abnormalities.

4. Skeletal

- Loose subluxated Joints.
- High stature.

Others

- Hereditary telangiectasia: with pulmonary A-V. fistula
- Neurofibromatosis: with pheochromocytoma
- Polydactyl: with ASD
- Low set ear & depressed nose: in cong. A.S.
- Some Genetic defects:
- Down's syndrome: (A.S.D.).
- Turner's syndrome: (coarctation of aorta).

Upper Limb :

1. Appearance and size of hand and fingers: e.g. spade hand (Acromegaly) (See page 31 picture H5)
2. Temperature of hands.

Warm hands:	Cold hands:
• Fever • Hyperdynamic circ • Central cyanosis.	• Low C.O.P state. • Peripheral cyanosis.

3. Sweating:

- Thyrotoxicosis
- Hyperhydrosis
- Neurosis.
- Toxaemia

4. Capillary refill. (defect filling in atherosclerosis) (See page 31 picture H9)

5. Osler's nodes, Jan way's patches & Splinter Hemorrhage (Inf. End) (See page 31 picture H7&8)

6. S.C. nodules: S.C. firm non tender nodules on extensor surface of arm & along tendons. (Rh. Fever / Rheumatoid arthritis).

7. Nails: (see above)

8. Joint abnormalities: (as Rh. A.)

9. Edema: (as above)

10. Tremors: (See page 31 picture H1,2,3&4)

- **fine tremors:** use a paper sheet (you can not count them)
- **Flapping tremors** = astraxis = coarse tremors: rapid flexion and extension of MCP joint examined by asking your patient to outstretch arms and fanning of fingers and if not appeared induce it by sudden dorsiflexion of pronated wrist.

11. Skin:

Dry skin in myxedema, moist in thyrotoxicosis, tight is scleroderma.

12. Lymph Nodes of the Upper Extremity:

- **Epitrochlear Nodes:** in the inner aspect, just above the elbow.
- **Axillary Nodes:**
 - Ask the patient to lift both arms away from the sides of his body.
 - Then extend the fingers of both your hands and gently direct them towards the apices of the arm pits.

13. palmer erythema: **PALM** (See page 31 picture H6)

Polythycemia and Pregnancy

Alcohol intake, Autoimmune (RA and SLE)

LCF& Leukemia

Medications "CCP" Miscellaneous "Thyrotoxicosis" .

14. Motor and sensory: see Neurology.

► **N.B.****Describe the following in any nodule or swelling**

- **Size:** Pathologic nodes are generally greater than 1 cm
- **Firmness:** Malignancy makes nodes feel harder
- **Quantity:** The greater the number of nodes, the more likely true pathology exists
- **Pain:** Often associated with inflammation (e.g. infection)
- **Relation** to other nodes and surrounding tissue

Xanthoma

Definition : Xanthomas are smooth surfaced yellow or orange plaques or nodules in the skin due to focal dermal aggregations of lipid-loaded cells (foamy histocytes)

Different types of hyperlipidemia may induce varying patterns of xanthomas:

1. Xanthelasma:

Subcutaneous deposits of cholesterol just medial to the eyelids (with type IIA & III or without lipid abnormality)

2. Plane xanthoma:

- On palmer creases (Type III) (See page 31 picture X1)
- Also occur with primary biliary cirrhosis

3. Tuberous xanthoma: (See page 31 picture X2)

Over the joints especially knees and elbow (type IIA, III)

4. Tendinous xanthoma:

Over the tendons eg. Achilles tendon , patellar tendon & finger extensor tendons (Types IIA& III)

5. Eruptive xanthoma: (See page 31 picture X3)

- Occur on the buttocks, posterior thighs (hyperlipidemia type I, IIB, III, IV & V)
- occur with primary biliary cirrhosis

Nail Examination :**1. Colour changes**

- **Pallor:** see before.
- **Cyanosis:** see before.
- **Leuconychia:** (See page 31 picture N3) Hypoalbuminemia
- **Yellow:** (See page 31 picture N4) Nicotine stains/Yellow nail syndrome [peripheral edema, bronchiectasis, pleural effusion]
- **Red Cherry red:** CO poisoning
- **Terry's nails** (See page 31 picture N5) (distal half is brown, while proximal half is white-pink): Cirrhosis / Chronic renal failure
- **Nail bed erythema = telangiectasia:** SLE

2. Spooning (Koilonychia): in sever chronic

(See page 31 picture N6)

- iron deficiency anaemia.

Lower Limb Examination :

as upper limbs without tremors.

1. Oedema: (see above)
2. Cyanosis.
3. Clubbing of toes.
4. Pellargic rash over the greater trochanter.
5. B.P. difference between upper and lower limbs (Hill's and reversal of Hill's)
6. Venous system for D.V.T & Varicose veins.
7. Deformity as in: Marfan's, Duchenne, myopathy, Friedreich's ataxia & other congenital diseases.

► Example for general examination (for long case) :

- **General condition attachment & appearance:** he looks ill with cannula in left forearm
- **Mentality:** patient is full conscious, oriented to time, place & persons, good mood & memory, he is cooperative with an average intelligence
- **Built:** average body built (just look, no measurement)
- **Decubitus:** patient in semi sitting position
- **Vital signs:**
 - **Pulse:** Patient pulse is regular, 75 beats / minute, average volume, equal in both sides, no special character, normal vascular wall & intact peripheral pulsations with no radiofemoral delay.
 - **BP:** 130/80 mmHg
 - **Temperature:** 37.1 °C
 - **R.R.:** 16 cycles/min/ Abdomino thoracic
- **Face:**
 - No specific feature
 - No pallor, jaundice or cyanosis
 - (NAD) no abnormalities detected
- **Neck examination:** 3 tubes + 2 glands + skin
 - **Neck vein:** non Congested neck veins with normal waves (Systolic collapse and normal inspiratory emptying). **CVP < 7 Cm water.**
 - **Carotid A.:** palpable, equal, No thrill or burt
- **Trachea:** central, normal cricosternal distance, No trachea tuge
- **No thyroid swelling**
- **No cervical L.N.++** (if present describe it)
- **Upper limbs:** both sides
 - **Hand:**
 - Normal shape
 - Clubbing
 - NAD:
 - **Skin, pigmental, scars ... etc**
 - **Muscles wasting, hypertrophy ... etc**
 - **Drained L.N. axillary LN**
- **Lower limbs:** both sides
 - **Feet:**
 - Shape
 - Clubbing
 - Odema
 - (NAD):
 - **Skin pigmental, scars,**
 - **Muscles wasting, hypertrophy,**
 - **Drained L.N. popliteal & inguinal LN**
- **Back:** No deformity, scar, swelling, tenderness, or pigmental
- **System review:** No abnormalities were detected as regard CVS, chest, neurological or abdominal examination

► Important Signs in General Examination :

H1- Fine tremors



H2- Flapping tremors (outstretched hand)



H3- Flapping tremors (Movement of wrist & MCP)



H4- Flapping Tremors (induced by wrist doriflexion)



H5- Spade like hand (acromegaly)



H6- Pulmar erythema



H7- Osler's nodule & Janway sign



H8- Osler's nodule



H9- Capillary filling: Press until turns white then release & count time until return normal



N1- Onycholysis



N2- Onycholysis



N3- Leukonychia (white nails)



N4- Yellow nail



N5- Terry's nail



N6- Nail spooning (Koilonychia)



N7- Splinter Haemorrhage



X1- Pulmar Xanthoma

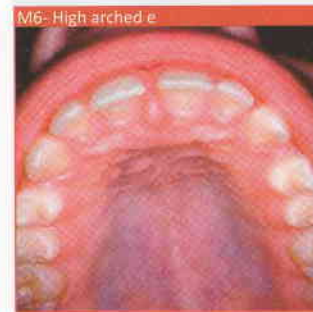
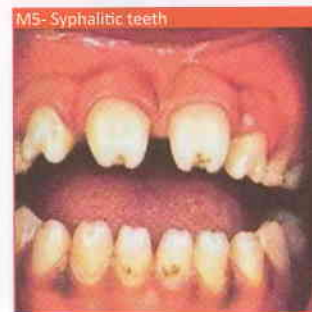
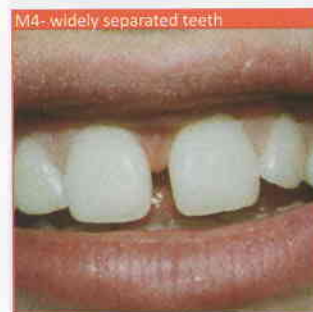
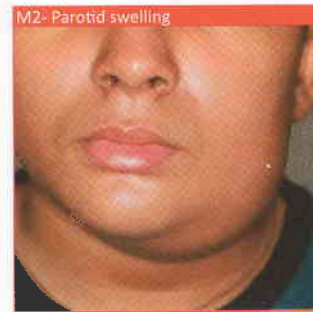
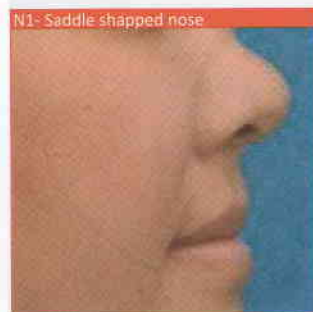
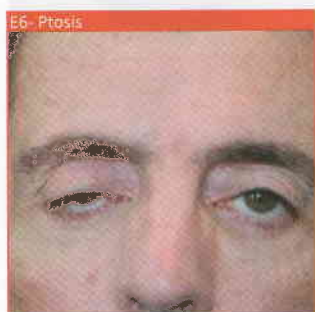
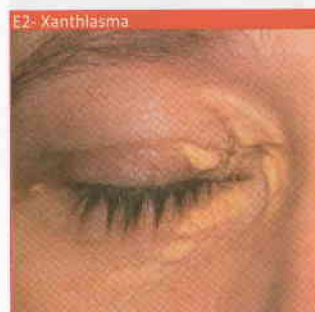
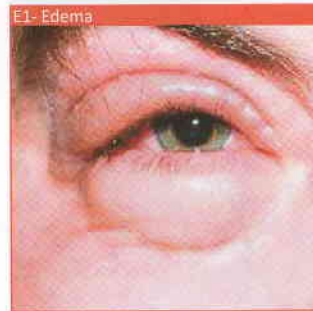
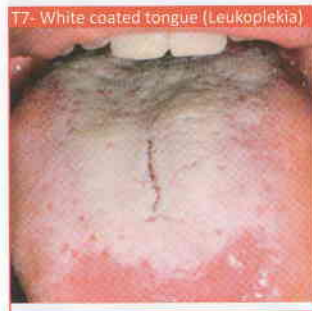
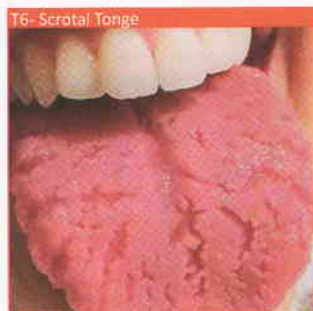
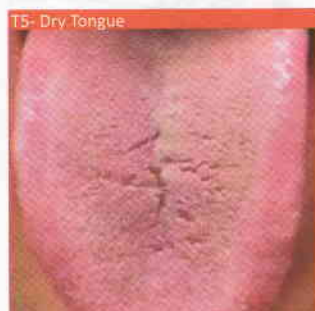
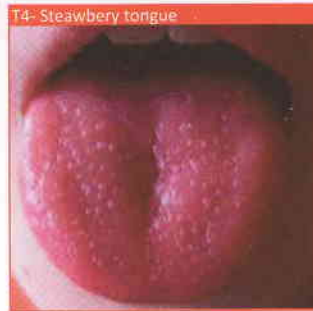
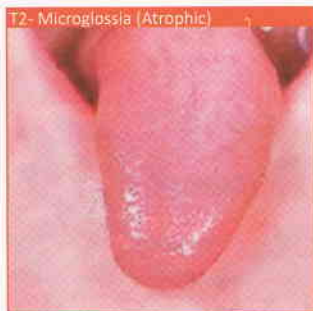
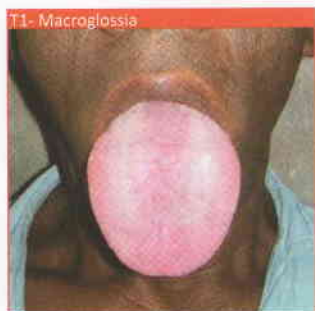


X2- Tuberous xanthoma



X3- Eruptive Xanthoma





GENERALIZED LYMPHADENOPATHY

► Causes :

- **Infective:** bacterial (T.B.), viral (viral hepatitis, IMN), protozoal (toxoplasmosis, syphilis).
- **Haematological malignancy:** leukemia (CLL), lymphoma (Hodgkin's - lymphosarcoma).
- **Neoplastic:** secondaries.
- **Infiltrative:** amyloidosis.
- **Miscellaneous:**
 - Collagen : SLE, Felty syndrome & Still's disease.
 - Sarcoidosis.
 - Serum sickness.
 - Grave's disease.
 - Drugs: phenytoin.

► History :

- **Onset:** acute in leukemia, gradual in CLL.
- **Age:** middle age in T.B. - old CLL - Hodgkin age 18 - 25 years, another peak at 60 - 70 y.
- **Fever:** Pel Ebstein in Hodgkin.
- **T.B.:** toxemia, anti T.B., sanatorial ttt, LN biopsy (+ sinus, scare).
- **Leukemia:** bleeding & bony pain.

► Examination of Lymph Nodes :

Using your middle 3 fingers, glands are rolled up & down, back & forward in a rotator movement.

- **Cervical LN:** Waldeyer ring
 - Circular group: submental - submandibular - pre auricular - post auricular - occipital.
 - Vertical group: upper & lower deep cervical (under cover of sternomastoid).
- **Supra-clavicular LN:** palpated in supra clavicular fossa.
 - **Virchow's gland:** left supra clavicular LN (suggestive of abdominal carcinoma).
 - **Scalene LN:** part of supra clavicular LN - they lie on scalenous anterior muscle.
- **Axillary LN:** arm is abducted & supported on examiner forearm - these consists of :
 - Anterior group: behind pectoralis major.
 - Posterior group: on posterior wall of axilla.
 - Lateral group: along axillary vessels.
 - Medial group: on chest wall.
 - Apical group: in the apex of axilla.
- **Supra (epi) trochlear:** little above medial epicondyle of humerus.
- **para aortic LN:** umbilical & epigastric regions along lateral border of aorta.
- **Mediastinal LN:** D'espine sign in chest

Despin's sign: bronchial breathing below the level of trachea " 4th thoracic vertebra" due to enlargement of the inter bronchial lymph node.

Causes:

 - T.B.
 - Carcinoma..
- **Inguinal LN:**
 - Superficial group (arranged transversely).
 - Deep group (arranged vertically along medial side of femoral vein).

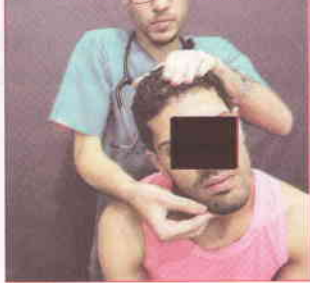
See next page

► Lymph nodes examination :

Submental LN examination



Submandibular LN Examination Rt.



Submandibular LN Examination Lt.



Pre-auricular LN examination (Rt. & Lt.)



Post-auricular LN examination (Rt & Lt.)



Occipital LN examination (Rt & Lt.)



Superficial Cervical LN examination Lt.



Upper Deep Cervical LN examination Lt.



Lower Deep Cervical LN examination Lt.



Supra-Clavicular LN examination



Virchow's LN Examination Lt.



Supra trochlear LN Examination Lt.



Ant. axillary group Examination Lt.



Post. axillary group Examination Lt.



Lat. axillary group Examination Lt.



Med. axillary group Examination Lt.



Apical: axillary group Examination Lt.



Despin's sign:
Mediastinal LN Examination



• Carcinoma
• Lymphoma
• Superficial group (arranged transversely)
• Deep group (arranged vertically along midline of neck)



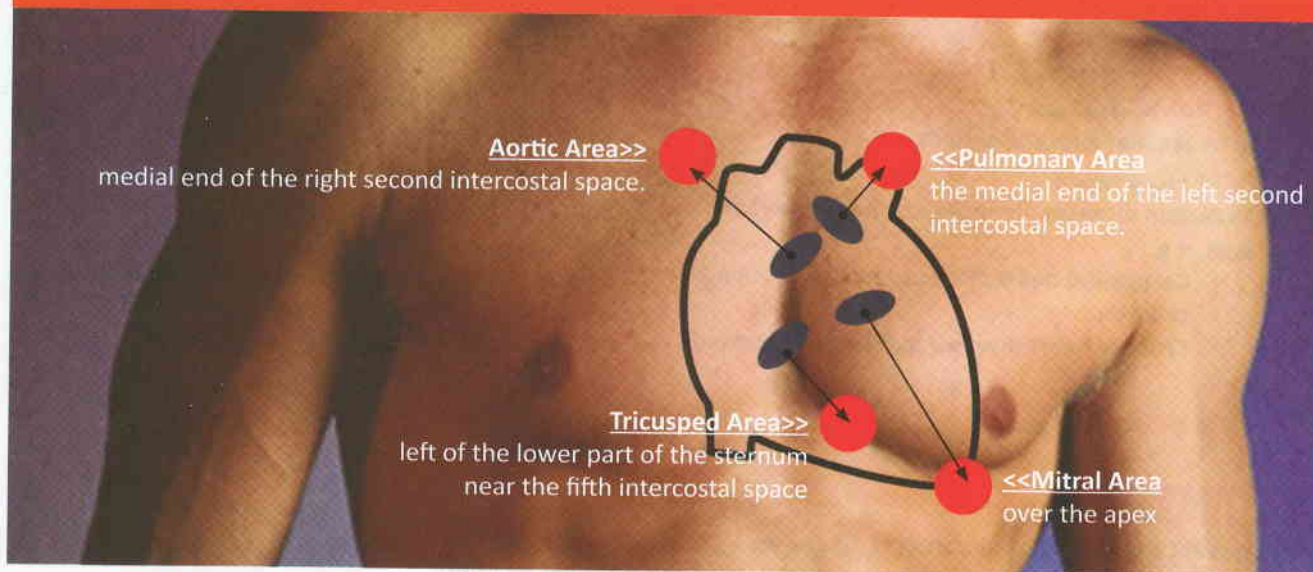
CARDIOLOGY

||

Rare presentations of common diseases are much more common than common presentations of rare diseases

||

INTRODUCTION



► Surface anatomy of the heart:

- The upper limit of the heart reaches as high as the **third costal cartilage** on the **right** side of the sternum and the **second intercostal space** on the **left** side of the sternum.
- The right margin of the heart extends from the **right third costal cartilage** to near the **right sixth costal cartilage**.
- The left margin of the heart descends laterally from the **second intercostal space** to the **apex** located near the **midclavicular line in the fifth intercostal space**.
- The lower margin of the heart extends from the sternal end of the right sixth costal cartilage to the apex in the fifth intercostal space near the midclavicular line.

Surface anatomy of the cardiac valves

- P (**pulmonary**): deep to the left 2nd sterno-costal junction.
- A (**Aortic**): opposite the left 3rd intercostal space.
- M (**mitral**): deep to the left 4th sterno-costal junction. So the above three valves present behind the left border of the sternum.
- T (**tricuspid**): behind the center of the sternum opposite the left 5th intercostal space.

Site for Auscultation:

To listen for valve sounds, position the stethoscope downstream from the flow of blood through the valves

- The **tricuspid valve** is heard just to the left of the lower part of the sternum near the fifth intercostal space.
- The **mitral valve** is heard over the apex of the heart in the left fifth intercostal space at the midclavicular line.
- The **pulmonary valve** is heard over the medial end of the left second intercostal space.
- The **aortic valve** is heard over the medial end of the right second intercostal space.

CARDIAC SHEET

General
Local

1- History:

2- Examination:

3- Investigations.

4- Diagnosis.

5- Treatment.

Personal history.

Complaint.

History of present illness:

Past history

Family history.

Analysis of the complaint.

Symptoms of the related system .

Other systems.

Investigations and treatment history.

DM & HTN

CARDIOLOGY HISTORY

► Personal History:

1. Name: اسم حضرتك ايه؟

to be familiar with the patient.

2. Age: عندك كام سنة؟

As certain diseases are more common in certain ages, e.g.

- **Congenital heart diseases:** infants & young children.
- **Cronary heart disease:** middle aged and old.

3. Sex**4. Occupation:** بتشتغل ايه؟**5. Marital state:** متزوج؟ عندك اولاد؟ كام؟ اصغرهم عنده كام سنة؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
for possible sterility or impotence.**6. Residence:** ساكن فين؟**7. Special habits:**

بتدخن؟ كام سيجارة في اليوم؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
بتشرب خمر أو مخدرات؟ بطريقة منتظمة ولا في المناسبات؟ نوع الخمر؟
e.g. Smoking is considered as a risk factor for alot of cardiac diseases as ischemic heart diseases.

8. Mensterual History.

► Complaint:

ايه اللي تاعبك؟ ايه اللي جابك المستشفى؟ بقاله ادا ايه التعب؟
(take the most recent and most important complaint and it should be brief)

Examples:

the patient is complaining of shortness of breath of 2 days duration

► History of present illness (H.P.I.):

1. Analysis of complaint.
2. Symptoms of the related system.
3. Systemic Review.
4. Investigation & treatment (related diseases).

HPI should be:

- As long as possible and Contains medical terms.
- In chronological arrangement.
- In the form of a story.

1- Analysis Of The Complaint:

For analysis of any complaint in chest as usual (8) + 3 for any excreta.

8 as usual:

- Onset - course - duration. ؟ أو بتحدث في نوبات ؟
- Association. ؟ هل كانت مصحوبة بحاجة وتذكر الأعراض الثانية اللي ممكن تكون موجودة ؟
- What increase and what decrease. ؟ وإيه اللي بيقلله ؟
- Effect of treatment. ؟ تأثير العلاج عليه ؟؟ هل لما بتأخذ العلاج الأعراض بتقل ولا بتفضل زي ما هي ؟
- Date of last attack. ؟ آخر مرة جالك العرض " وتقول إسم العرض ده " كان إمتى ؟

+ 3 for any pain:

- Site
- Character
- Radiation



When you were a kid at primary school, Miss Hanan taught you how blood moves inside the heart and the great vessels; Will, we call this **HAEMODYNAMICS**; you better recall this as we gonna use it next page explaining the symptomatology of valvular heart disease...

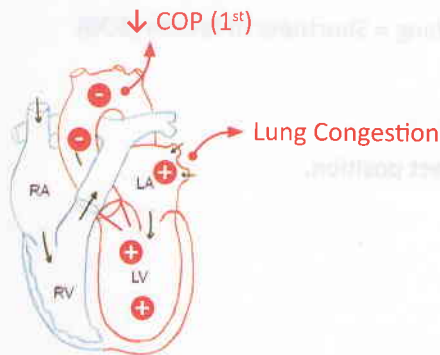
Wasn't she awesome?!



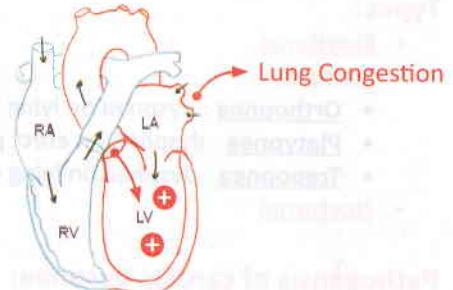
► Introduction to cardiology symptoms :

Aortic Stenosis (AS):

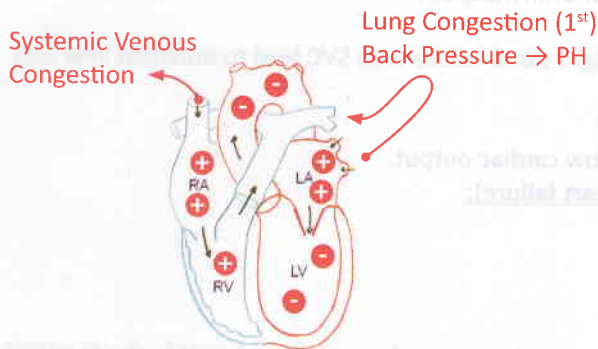
↓COP → LVF (Pulmonary Congestion)


Aortic Regurge (AR):

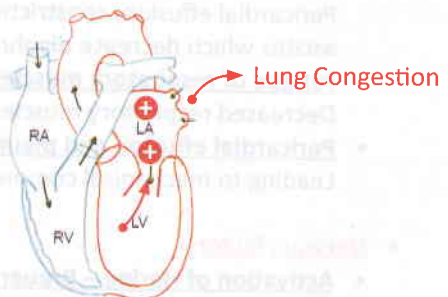
Regular Palpitations + LVF (Pulmonary Congestion) + Peripheral signs


Mitral Stenosis (MS):

Pulmonary Congestion → PH (↓COP) → RVF
(Systemic Congestion) ± AF (Irregular Palpitations)


Mitral Regurge (MR):

Regular Palpitations → LVF (Pulmonary Congestion)


Tricuspid Regurge (TR):

Regular Palpitations + RVF (Systemic Congestion)

Symptomatic Diagnostic Approach:

1st Presentation: Pulmonary Congestion → MS

1st Presentation: ↓COP → AS

Rheumatic Disease with ↓COP:

- MS: Dyspnea (Pulmonary Congestion) followed by ↓COP
- AS: ↓COP as 1st presentation

Palpitations:

- Irregular: AF
- Regular:
 - AR: Peripheral Signs
 - MR: Palpitations Only
 - TR: Systemic Venous Congestion

2- Symptoms of Cardiology:

- | | | |
|----|---|--|
| 4C | <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black;"></div> </div> | 1. Pulmonary C ongestion.
2. Systemic venous C ongestion.
3. Low C ardiac output.
4. C yanosis. |
| 4P | <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black;"></div> </div> | 5. P alpitation.
6. P ain.
7. P ressure manifestations.
8. B lood p ressure changes. |
| + | <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> </div> | 9. F ever.
10. T hrombo-embolic manifestations. |

1. Pulmonary Congestion :

Caused by: M.S. & LVF

Including: (dyspnea, cough, haemoptysis & recurrent chest infection)

► Dyspnea :

Is abnormally uncomfortable awareness of the act of breathing = Shortness of breath (SOB)

Types:

- **Exertional**
- **Postural**
 - **Orthopnea** : dyspnea on lying flat relieved with erect position.
 - **Platypnea** : dyspnea on erect position
 - **Trepopnea** : dyspnea on lying on one side.
- **Nocturnal**

Pathogenesis of cardiac dyspnea:

- **Mechanical factors:**
 - **Pulmonary congestion:** (leading to ↓ lung compliance) occurs in left sided heart failure or lesion leading to:
 - Decreased lung compliance due to interstitial edema (the most important factor).
 - Diminished alveolar capacity with transudation in some alveoli.
 - Congestion of bronchial mucosa with or without bronchospasm.
 - **Infra-diaphragmatic causes:**
Pericardial effusion, constrictive pericarditis and right sided failure with SVC lead to enlarged liver and ascites which decrease diaphragmatic mobility.
 - **Fatigue of respiratory muscles:**
Decreased respiratory muscles' perfusion due to low cardiac output.
 - **Pericardial effusion and pleural effusion (with heart failure):**
Leading to mechanical compression of the lungs.
- **Nervous factors:**
 - **Activation of Hering – Breuer reflex:**
This is a normally present reflex in which impulses arise from stretch receptors present in the terminal air passages at the end of inspiration, this leads to reflex inhibition of inspiratory center and passive relaxation of the chest → expiration.
In left sided failure, interstitial oedema activates this reflex, causing shallow rapid breathing.
 - **Churchill – cope reflex:**
It occurs in pulmonary venous congestion which leads to reflex stimulation of respiratory center, through the juxtacapillary receptors of the lung which are stimulated due to pulmonary venous congestion (high pulmonary capillary pressure).
- **Chemical factors:**
Pulmonary venous congestion and diminished tissue perfusion (↓ COP) lead to hypoxia, which stimulate respiration.

Complaint: -

- Shortness of breath (SOB) – exertional هل عندك نهجان أو غرشة نفس ؟؟؟
- Orthopnea: - Dyspnea on lying flat & relieved on erect position. تسأل المريض بينام على كام مخدة؟؟؟

NYHA classification of dyspnea:

I	Dyspnea on more than ordinary effort
II	Dyspnea on ordinary effort
III	Dyspnea on sub ordinary effort
IV	Dyspnea on Rest

► **Paroxysmal nocturnal dyspnea (PND) :**

Dyspnea, cough + wheeze developed 1-2 hours after sleep , Spontaneously resolved called the **Cardiac Asthma**

بتسأل ,, لما بتنام بتكمل نوم للصبح ولا بتصحى ??? ولو بتصحى ,, إمتى ??? وعلى إيه ???

Mechanism of PND:

- Increased V.R. during sleep leading to aggravation of pulmonary congestion.
- Absorption of oedema fluid into the circulation causing further increase in V.R.
- Diminished Sympathetic activity during sleep causing reduction of cardiac contractility.
- Night mares lead to tachycardia and elevation of BP.
- Slipping down from high pillows.

	Cardiac A.	Bronchial A.
Age	any age	young age
Other symptoms	+ cardiac symptoms	chest symptoms
Duration	short duration	long
Time of attack	1 - 2 hrs after sleep	Early in the morning
Relieved	Spontaneously	Bronchodilators
Dyspnea	Inspiratory	Expiratory
Sputum	Frothy (may be blood tinged)	Thick.

► **N.B.**

PND is highly specific for cardiac cases.
Diagnostic for left sided HTF.
But we have to exclude B.A.

2. Systemic congestion :

Caused by: right ventricular failure (M.S. & T.R.)

Manifested by:

- **Oedema L.L. usually before ascites:** bilateral, pitting, painless, dependent
- **Ascites precox** = ascites before LL oedema in cases of pericardial & tricuspid diseases.
- **Hepatic congestion:** Pain in right hypochondrium + Jaundice.
- **G.I.T congestion** = Dyspepsia.

► **Q :** Jaundice in cardiac patient?

- Associated viral infection.
- Haemolytic Jaundice = pulmonary infarction or metallic valve
- Hepatocellular Jaundice = hepatic congestion (cardiac cirrhosis)
- Obstructed Jaundice = hepatic congestion obstruct the biliary tract

► **Mechanism Of ascites precox:** Occures in Pericardial effusion or constrictive pericarditis due to kinkling of hepatic viens with sever hepatic congestion and also with tricusped diseased due to marked hepatic congestion

3. Low cardiac output :

فوق	• Syncope • Headache. • Blurring of vision + Syncope. • Dizziness
في النص	• Anginal pain • Kidney = Oliguria
تحت	• Muscle = easy fatigability • Skin = pallor /cold.

The key word is Syncope

Syncope: sudden transient complete loss of consciousness due to reduced cerebral blood flow. If the ischemia prolongs, convulsions may occur. It is associated with postural collapse with spontaneous recovery.

Complaint: Fainting or Black out.

Etiology of syncope:

1. Vasomotor syncope
2. Cardiac syncope (4A)
3. Cerebral syncope
4. Hypoxic syncope
5. Postural syncope
6. Situational syncope

► **N.B.****Cardiac syncope:**

- Usually exertional
- Not accompanied by convulsions

Etiology of syncope:**1. Vasomotor syncope:**

- **Vasovagal syncope (neurogenic syncope):**
 - It results from severe vagal stimulation which leads to: severe bradycardia, hypotension, pallor & sweating.
 - It results from: sudden severe fear, pain, and trauma (e.g. to testicles).
 - It is the most common cause of syncope & is known as simple fainting.
- **Carotid sinus syndrome:**
 - It results from pressure on hypersensitive carotid sinus baroreceptors: e.g. during shaving.

2. Cardiac syncope

(Any cause of ↓ow COP) especially:

- Aortic stenosis (only with exertion) (or any other valvular obstruction).
- Acute heart failure (e.g. AMI) if damage > 40%
- Arrhythmias (whether tachy or brady arrhythmia).
- Adams-stokes attacks.

3. Cerebral syncope

(Reduced cerebral blood flow)

- Vertebrobasilar TIAs.

4. Hypoxic syncope (↓ O₂ content of the cerebral blood flow)

- Fallot's tetralogy & other cyanotic diseases or severe anemia.

5. Postural syncope: (Orthostatic syncope)

- Normally, reflex VC of blood vessels of L.Ls occurs on standing to prevent pooling of blood in lower limbs.
- This effect is mediated through sympathetic stimulation.
- If this mechanism is defective, BP will be markedly lowered in the standing position (postural hypotension) & syncope may occur.

Causes include:

- Autonomic neuropathy, e.g. Diabetes.
- Sympatholytic drugs, e.g. ganglion blockers & vasodilators.
- Lumbar sympathectomy.
- Hyponatremia.
- Prolonged recumbency.
- Elderly patient.
- Huge varicose veins.
- Hypovolaemia. e.g.: Haemorrhage or dehydration.
- Weakness of the muscles of the lower limbs (muscle pump).
- Lt. atrial myxoma

6. Situational syncope

Rare syncope caused by a variety of activities in susceptible individuals:

- Cough syncope (Tussive syncope).
- Micturition syncope (more common in old men especially at night).
- Defecation syncope.

Underlying mechanism:

Straining → decreased VR → decreased COP → syncope.

4. Cyanosis :**Age of onset:**

- Since birth = Fallot's tetralogy.
- Few years after birth = Fallot's triology.
- In teenager = Eisenminger's syndrome (reversed shunt).
- Above age of 40 years = COPD with or without Corpulmonale.

Cyanotic spells and squatting: Fallot's tetralogy.

Differential cyanosis: P.D.A with reversed shunt.

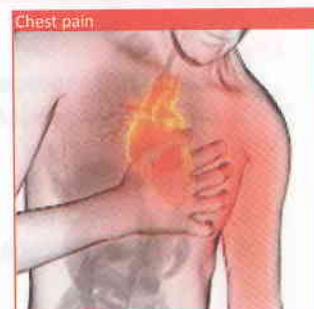
Exertional cyanosis: cases of cardiac shunts / cases of a cyanotic Fallot's / interstitial pulmonary fibrosis.

5. Pain :**Don't forget 11 points:**

1. **Onset:** sudden for example; anginal pain
2. **Course:** intermittent.
3. **Duration:** 30 sec. → 30 min.
4. **Association:**
 - Angor animi.
 - Dyspnea.
 - Sweating.

5. What increase:

- Exercise.
- Sexual intercourse.
- 5 Hs.
- Heavy meal.
- Heavy smoking.
- Hypothermia.
- High attitude.
- Stress اللهم



6. What decrease:

- Rest.
- Sublingual nitrate.

7. Effect of treatment: Respond

8. Last attack: Describe it.

9. Site: Retrosternal.

10. Radiation: Left shoulder, Jaw, Epigastric & Back

11. Character: any type except stitching.

► N.B.

Anginal pain never to be:

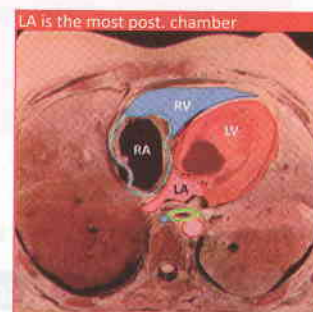
- Localized.
- Infra mammary.
- Stitching.
- > 30 min.

6. Pressure manifestations :

The most posterior chamber of the heart is the Lt Atrium, which is markedly enlarged in M.S. & M.R.

Pressure symptom on:

- **trachea:** brassy cough.
- **Bronchus:** dyspnea
- **Oesophagus:** dysphagia
- **Left recurrent laryngeal nerve:** hoarseness of voice (**Ortner's**).
- **SVC:** oedema and cyanosis of face and U.L.

**7. Palpitation :**

Complaint: Awareness of heart beats

Cause:

- Rapid heart rate. e.g.: Sinus or paroxysmal tachycardia.
- Forcible heart contraction (volume overload). e.g.: A.I. or M.I.
- Irregular heart, e.g.: extrasystole or A.F.
- Cardiac neurosis.

Ask about:

- Is it regular or irregular?
- Precipitating factors.

8. Manifestations of hypertension :**Hypertension symptoms:**

- Asymptomatic
- Fatigue (Most Common presentation)
- Headache.
- Blurring of vision.
- Tinnitus.
- Epistaxis.

► N.B.

No symptoms of diagnosis of hypertension, only history of regular use of anti hypertensive drug.

9. Embolic manifestations :

Embolus: Insoluble material in circulation

Source:

Atrium	Valve	Ventricle	Vessel
Left atrium in M.S. and A.F.	Vegetation in infective endocarditis	Myocardial infarction	Aortic atheromatus plaque

Effect:

Cerebrum	Coronary artery	Peripheral artery	Eye	Renal artery	Superior mesenteric artery
Hemiplegia.	Chest pain.	• Pulsless. • Pallor. • parasthesia or • Paralysis.	Blindness	Painless haematuria.	Abdominal pain (intestinal obstruction)

10. Fever in cardiology :**Aetiology:**

Cardiac	Vessels	Lung
• Endocardium: • Infective endocarditis (serious). • Rheumatic fever (commonest). • Myocardium: • Myocarditis. • Myocardial infarction. • Pericardium: • Pericarditis. • Effusion.	• Thrombophlebitis. • D.V.T.	• Pulmonary embolism. • Pulmonary infection.

3- Other Systems :

Dont forget to ask about symptoms of other systems

4- Investigations & Treatment :

As X ray, ECG, Echo & Cathetrization

5- Diabetes Mellitus and Hypertension :

This is end of HPI, dont forget the rest of sheet

► Past History :

- Diseases as Rheumatic fever
- Operations
- Drugs as:

Drugs that cause Hypertension: 6 Cs

- Corticosteroids.
- Licorice.
- Contraceptives.
- Amphetamine and thyroxin.
- Carbenoxolone.
- Anti Common Cold drugs.
- Cyclosporin.

► Family History :**Pulmonary congestion**

هل عندك نهجان (كثرة نفس) ؟؟
بتنام على كام مخدة ؟؟
بتكمل نوم للصبح ولا لا ؟؟؟
فيه غثة أو التهابات على الصدر متكررة ؟؟؟
هل البلغم معرق بدم ؟؟؟

Systemic venous congestion

رجلك أو بطنك نفخت ؟؟؟
فيه ألم في جنبك اليمين ؟؟؟

Cardiac output

هل عندك صداع أو زغللة أو إغماءات ؟؟؟
لما تمشي فيه وجع في عضلاتك ؟؟؟

Cyanosis

إزرقيت ؟؟؟ (حصل زرقعة) ؟؟؟

Pain

عندك ألم في الصدر ؟؟؟

Pressure manifestations

هل صوتك اتنبح ؟؟؟
عندك صعوبة في البلع ؟؟؟

Palpitation

بتحس بضربات قلبك ؟؟ (رفرفة) ؟؟؟

Blood pressure changes

بتأخذ أدوية للضغط ؟؟؟

Embolic manifestations

حصل ثقل في لسانك ؟؟؟ أو إيدك ؟؟ أو رجلك ؟؟

Fever

حصل إرتفاع في درجة الحرارة ؟؟؟
وتسأل المريض برودو



GENERAL EXAMINATION

A **أرقام Vital Signs:**• **Pulse:**

- Irregular as in AF
- Big pulse volume as in AR
- Special Character:
 - Water Hammer Pulse as in AR
 - Pulsus Deficit > 10 per minute in AF

Full comment on pulse is so important in cardiac sheet

• **Blood Pressure:**

- Low systolic as in AS & HF
- High systole & low diastole in AR

• **Respiratory Rate:**

Tachypnea in dyspnic patient

• **Temperature:** Fever in

- Recurrent chest infection
- Infective endocarditis

B **Built:** Over built, average built or under built

Over built
Generalized edema.



average built



under built

- In congenital heart disease. Or
- Rheumatic disease since childhood.

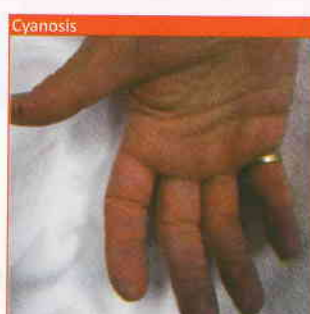
C **Complexion:****Pallor:**

- Associated anemia.
- Edema (appears pale).
- Shock.
- ↓ C.O.P.
- Rheumatic fever.
- Infective endocarditis.

Cyanosis:

- **Central:** Congenital heart disease, Hypoxia & Corpulmonale.
- **Peripheral:** Systemic venous congestion
- **Differential Cyanosis**

Jaundice: See before

**D** **Decubitus or position**

Orthopnea, Squatting & Praying position. See general

- E** **(H & N): Congested neck vein:** See below
- upper limb:** **Clubbing:** **Pale:** Infective endocarditis & Left atrial myxoma.
- lower limb:** **Manifestations of IE** **Blue:** Congenital heart disease.
- Lower limb edema:** **Others:** Differential clubbing & Unilateral clubbing
- Right sided heart failure.
Pericardial disease.

► **N.B.**

Clubbing in LL is seen in **big toe** and detected by ruler; Not in other toes as they show physiological clubbing

► **Clinical significance of neck veins :**

Normally: They are non congested, & are pulsating with systolic collapse.

Abnormally:

- **Abnormal pressure "congested neck vein"**
 - **Pulsating:**
 - Right sided heart failure.
 - Pericardial effusion & constrictive pericarditis.
 - Hypervolemia.
 - **Non-pulsating:**
 - SVC obstruction (SVC thrombosis or Mediastinal syndrome).
- **Abnormal pulsations "abnormal waves"**
 - **a-wave:**
 - **Absent:** AF.
 - **Giant:** pulmonary hypertension, PS, TS.
 - **Canon waves:**
 - Regular: nodal rhythm.
 - Occasional: A-V dissociation.

• **Giant V:**

- **obliterated** (systolic expansion of neck veins):
 - TR.
 - AF.
 - Constrictive pericarditis.
 - Pericardial effusion.
 - Rt. H.f.

Congested Neck Vein



Measuring neck vein pressure

► **Examination of Other Systems in Cardiology Case :****Chest:**

Cause	Result	Association
Corpulmonale	• Chest infection. • Pleural effusion. • Crepitations.	Kartagener's syndrome = Bronchiectasis + dextrocardia + absent frontal air sinus

CNS:

Cause	Result	Association
• Silent MI • Postural Hypotension	• AF → Embolic hemiplegia • HTN → Thrombotic hemiplegia	• Cardiomyopathy in Duchenne myopathy & Friedreich's ataxia

Abdominal Examination:**Spleen**

- **Palpable** = cirrhosis.
- **Palpable & tender** = infective endocarditis.

Ascites

- Normal sequels
- **Ascites precox** = pericardial disease - T.R.

Liver

- **Palpable** = Liver cirrhosis (Cardiac cirrhosis - B fibrosis)
- **Palpable + tender** = congested liver = Rt HF / Pericardial diseases.
- **Palpable + tender + pulsating** = pulsating liver = T.R. (systolic) / T.S. (diastolic).
Other causes of pulsating liver: Highly vascular hepatic tumor or from aortic aneurysm.

► **Causes of Pulsating Liver:**

- Tricuspid Disease
- Highly vascular hepatic tumour.
- transmitted from abdominal aneurysm

Detected by bimanual examination

Bimanual Liver Palpation



INTRODUCTION TO LOCAL CARDIAC EXAMINATION

Patient Positioning:

- Expose the patient's chest up to the umbilicus.
- Position the patient supine with the head of the table slightly elevated.
- Always examine from the patient's right side.
- Make sure that the patient is comfortable in this position.

► Value of Precordial examination:**1. Evidence of right ventricular enlargement:**

- Precordial bulge
- **apex beat:** (outermost lower most impulse)
 - Diffuse.
 - Shifted outwards.
 - Shows systolic retraction: accompanied by reciprocal left parasternal uplift (right ventricular rocking)
- Left parasternal & epigastric pulsation.
- Dullness over the lower half of the sternum.

2. Evidence of left ventricular enlargement:

- **Apex beat:**
 - Localized.
 - Shifted outward & downward.
 - Shows systolic bulge: accompanied by reciprocal left parasternal retraction (left ventricular rocking)
- **Apex impulse:**
 - Heaving (forcible, sustained): pressure overload.
 - Hyperdynamic (forcible, non-sustained): volume overload.
 - Hypodynamic (weak): myocardial disease.

3. Evidence of great vessel dilatation:

- **Dilated pulmonary artery:**
 - Dullness & pulsation in the second left space.
- **Dilated aorta:**
 - Dullness & pulsation in the second right space.

4. Evidence of endocardial affection (valvular affection):

- Presence of specific murmurs & thrills.

5. Evidence of myocardial affection:

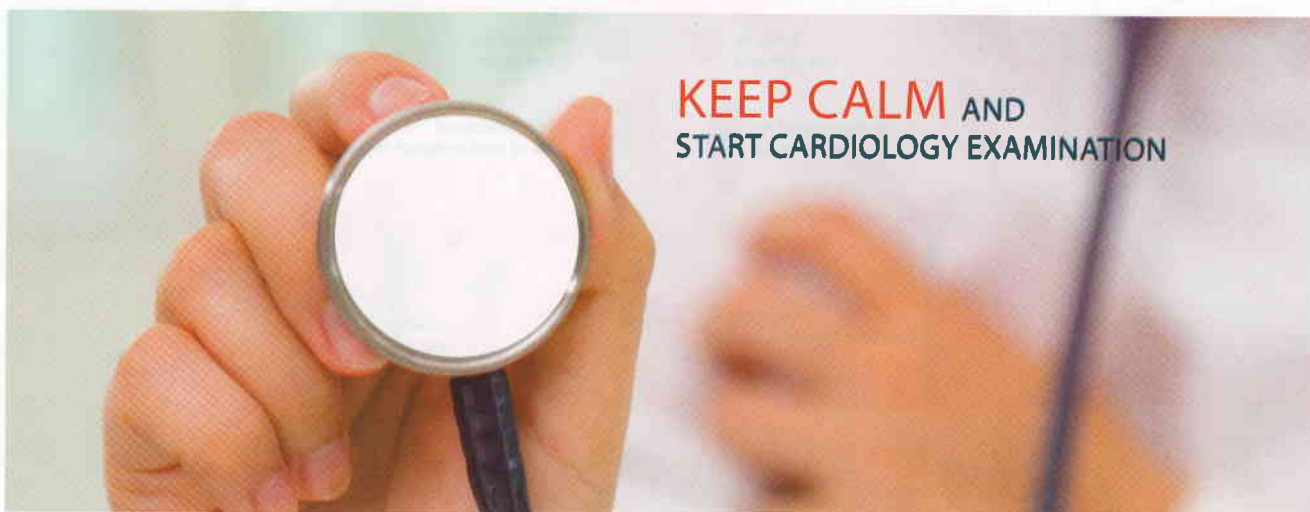
- Presence of S3 gallop over the mitral or tricuspid areas in LV or RV affection respectively.

6. Evidence of pericardial affection.**7. Evidence of pulmonary hypertension:**

- Inspection, Palpation & Percussion:
 - Pulsations, diastolic shock & dullness in the second left space.
- Auscultation:
 - Accentuated pulmonary component of the second heart sound.
 - Ejection systolic click.
 - Ejection systolic murmur due to relative pulmonary stenosis.
 - Early diastolic murmur due to functional pulmonary regurge (Graham Steel).
 - S4 over the tricuspid area.

8. Evidence of arrhythmias:

- Change in the rate or rhythm of the heart beats.



LOCAL CARDIAC EXAMINATION

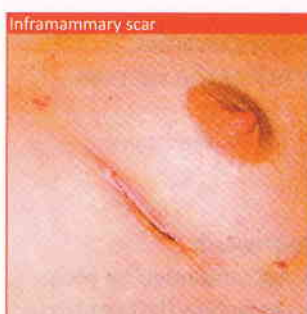
► Inspection :

1. Precordial bulge:

Long standing right ventricular dilatation or precordial effusion since childhood. Examined by looking tangentially from below the patient.

2. Scar of previous operation

- **Median sternotomy** (open heart surgery) e.g.; valve replacement or coronary bypass.
- **Inframammary** = lateral thoracotomy (closed heart surgery) e.g.: mitral valvotomy.

3. Dilated Veins: in SVC obstruction**4. Pigmentation:** not specific**5. Pulsations:** (by inspection & palpation together)

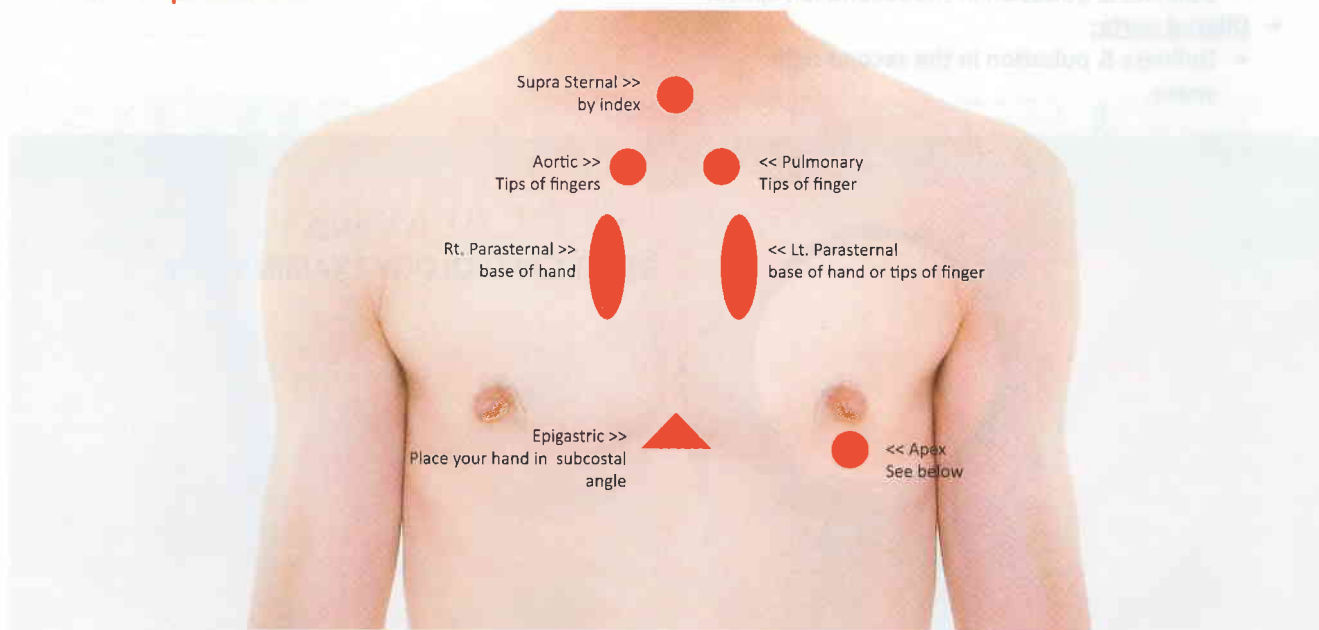
► Palpation:

for: Pulsations, Thrill & Palpable sounds

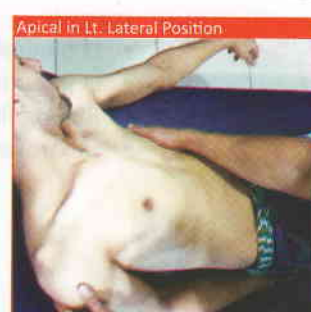
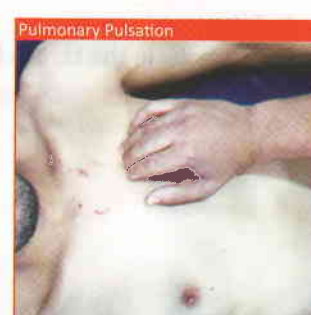
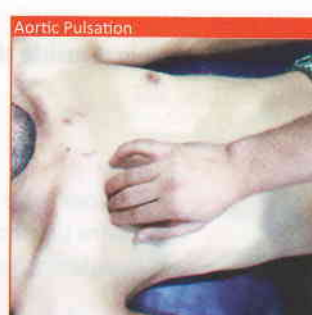
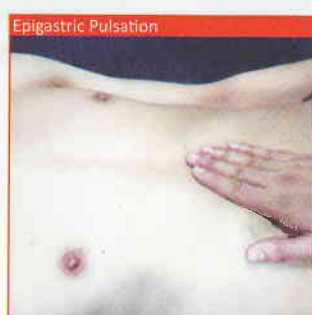
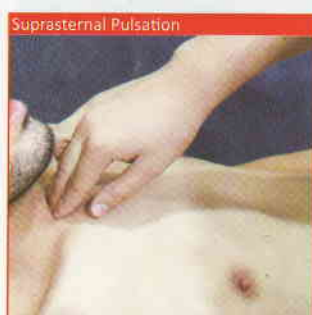
Usually inspect and palpate at the same time for detection of pulsations then search for thrill and palpable sounds by Palpation.

► Pulsations :

- In thin person all Pulsations may be present
- In obese persons, all Pulsations may be hardly to be detected
- In normal persons apical pulsations can be detected
- Visible epigastric Pulsations may be normal finding

Areas of pulsations:

Area	Technique	Aetiology
1- Supra sternal	in a semi setting patient Place your index in supra sternal notch	• thin person • Hyperdynamic state • A.R. "Corrigan sign" • Aortic aneurysm • High arch of aorta
2- Epigastric: Place your hand longitudinal in the subcostal angle. Pulsation classified according to the direction into:		
A) at tip of fingers	Increased with deep inspiration	RV++
B) from the right side	Enlarged & Tender during bimanual ex.	Hepatic P (TS & TR)
C) from behind	Pulsating down to umbilicus	Aortic P (thin, Hyperdynamic & aneurysm)
3- Aortic area	By tip of fingers (transverse)	Hypertension & A. aneurysm
4- Pulmonary area	By tip of fingers (transverse)	PH++ & P. aneurysm.
5- Rt. parasternal	By tip of fingers (Vertical) or palm of hand	Rt. Atrium++ & Lt. Atrium++
6- Lt. parasternal	By base of hand (increased by inspiration)	R.V. ++ & Lt. Atrium++
7- Apical	See below	

► **N.B.**

Left parasternal Pulsations may be just a **pulsations** or **heave**. (**Heave**: pulsation which lift your hand upward)

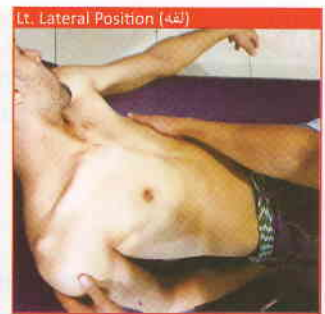
- Lt. Parasternal pulsations means **volume overload: TR or VSD**
- Lt. Parasternal heave means **tention overload: PS or PH**

► **Apex of the Heart :**

Apex: Outermost and lowermost visible and palpable part of the heart. It's produced by the anterior movement of the left ventricle during early systole, occurs during isometric contraction of the left ventricle. The normal apex felt as a **gentle non sustained tap**

Technique: (Inspection – palpation – left lateral position)

- First, by inspection
- Place your hand over the left hemi-thorax region
- Feel for the outer most and lower most pulsation.
- Left lateral position (for detection of weak P)
- Count the intercostal spaces (first identify the angle of Louis = the rib attached alongside this is the 2nd rib and the space below the rib is the 2nd space).
- Percussion or auscultation may be used for detection of absent apex.



Comment on apex:

1. Site: 5th Lt. MCL
2. Area.
3. Character
4. Thrill
5. Rate "Pulsus deficit".
6. Rhythm.
7. Rocking.

► N.B.

Absent apex: (OPERA):

Definition: Not visible or palpable apex even on left lateral position.

- Obesity.
- Pericardial effusion – pleural effusion.
- Emphysema.
- Rib "under rib".
- Anomalies "dextrocardia".

1. Site:

Normally in the Lt. 5th intercostal space just inside the M.C.L (3.5 inch from the midline)

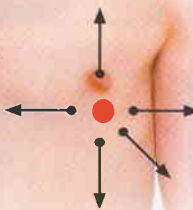
Shifting of the apex from the normal sit:

Upward:

- Upper lobe fibrosis.
- Infra diaphragmatic causes as ascites.

Inward:

- Lt pleural effusion
- Lt pneumothorax.
- Rt lung fibrosis.
- Dextrocardia.



Outward:

- RV ++
- Rt Pleural effusion
- Rt Pneumothorax.
- Lt Lung fibrosis or collapse.

Downward and Laterly:

- LV ++

Downward:

- Viscero-ptosis
- Thin person

2. Area (Extent):

Normally it is localized (less than one inch & occupies one space).

Diffuse apex: Right ventricular enlargement

The apex diameter is more than one inch or more than one space or the apex with ill-defined medial border

Localized apex: Left ventricular pulsation

The apex diameter is less than one inch or in one space or the apex with well defined medial border.

3. Character:

Defined as: Force and duration of the apex

- **Hyperdynamic** = forcible (In left lateral)
Volume overload as A.R. / MR / VSD.
- **Heaving** = Sustained.
Tension overload as systemic Hypertension / AS / A coarctation
- **Slapping** = papable S1 MS.

4. Apical Thrill & Palpable sound:

- **Thrill:**
 - Diastolic thrill in M.S.
 - Systolic thrill in M.I.
- **Palpable sounds:** 1st H.S. in M.S.

5 & 6. Rate & Rhythm:

Normal: Regular with HR equal to the radial pulse.

Irregular: (AF& extra systole) Apical rate for counting of Pulsus deficit.

7. Rocking:

Left ventricle ++: Apical bulge + left parasternal retraction (anti-clockwise)

Right ventricle ++: the reverse (clock-wise)

► N.B.**Double apex:**

- Ventricular aneurysm: - systolic – diastolic pulsation (paradoxical).
- Hypertrophic Cardiomyopathy: - systolic – systolic pulsation.

Don't get lost; We palpate for 3 things: Pulsations. Thrill & Palpable sounds

► Thrill :

Better to be detected by the palm of hand

Apex	Left parasternal	Base	
• Systolic = MR • Diastolic = MS	Systolic = VSD	Aortic area • Systolic = A.S. • Continuous = PDA	Pulmonary area • Systolic = P.S. • Continuous = PDA

Apical Thrill



Lt. Parasternal Thrill



Basal Thrill

**► Palpated sound :**

Better to be detected by the tip

- **Apex**
 - Palpable S1 in M.S.
 - Palpable S3 or S4.
 - Palpable rub.
- **Aortic area**
 - Palpable A2 "syphilitic A.R."
- **Pulmonary area**
 - Palpable pulmonary component of S2 in PH++.

► Percussion: Of no value in the recent medicine• **Hepatic dullness:**

- Start from the 2nd space downward on the Rt MCL by heavy percussion
- When you reach the hepatic dullness ask the patient to breath in (Tidal percussion)
- Upper border of the liver normally in the 4th or may be in the 5th space.

• **Right border:**

- Precede one space above i.e. 3rd space or 4th
- Percuss parallel to the right border of the sternum (from out to inward)
- Normally no dullness to the right of the sternum
- Dullness denotes: RA++, A aneurysm, pericardial effusion, dextrocardia & chest causes

► N.B.

- Heart percussion is heavy except for bare area

• Aortic area:

- Percuss the 2nd Rt space from lateral to medial (from MCL to the sternum).
- Normally it is resonant up to the sternum
- Dullness means:- A aneurysm (pulsating) Post stenotic dilatation (No pulsation)

• Pulmonary area:

- Percuss the 2nd Lt Space from lateral to medial (from MCL to the sternum).
- Normally 1.5 cm of dullness may be detected
- Increased dullness means: PH++ (pulsating) P. dilatation (No pulsation) or Pericardial effusion

► **N.B.** Dullness over Pulmonary area could be pericardial effusion or PH++ use shifting dullness to differentiate between them

• Waist (on request) :

- Percuss the 3rd left space
- Normally there is a1 finger of dullness.
- Increased dullness (obliterated waist):- LA++.

• Outside the apex:

- Percuss the apex from outer to inner at the same space
- Normal:- No dullness outside apex
- Dullness outside the apex: Pericardial effusion & chest causes

• Retrosternal:

- Percuss the lower 1/3 of the sternum directly by light percussion
- Normally impaired note
- **Dullness:** RV ++ & pericardial effusion

• Bare area of the heart:

- Def.: Area of heart not covered by lung
- "Normally dull" (see the chest)

• Shifting dullness:

- In **pericardial effusion:** Over the pulmonary area = Dullness at flat position disappear with sitting.

Tidal Percussion of hepatic dullness



Percussion of Rt border of the heart



Base of heart (Aortic Area)



base of heart (Pulmonary area) Lt. 2nd



Percussion outside the apex



Direct percussion on the sternum

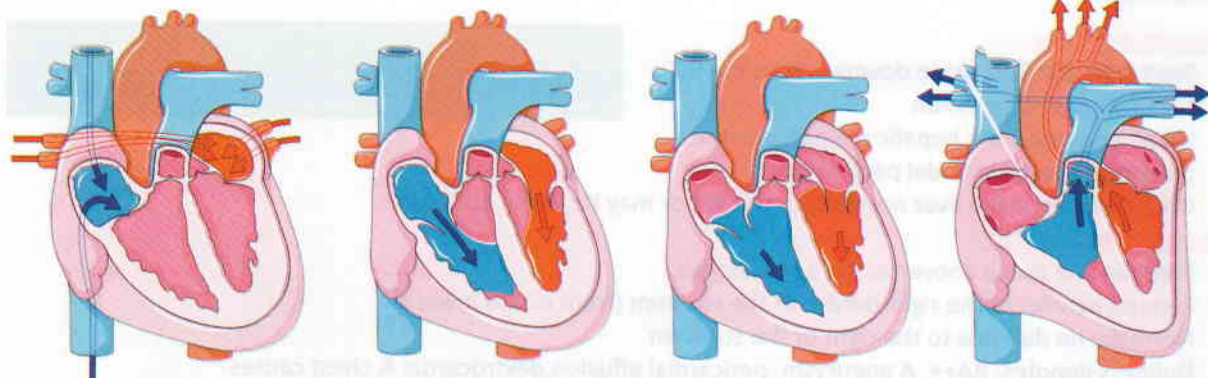


Percussion of heart waist (Lt. 3rd)



► Basics Of Auscultation :

Cardiac Cycle:



Systole (0.3 sec)	Diastole (0.5 sec)
1. first heart sound: The cardiac cycle start by contraction of ventricles resulting in closure of mitral & tricuspid valves producing the first heart sound (S1)	4. Second heart sound: After evacuation of blood, the ventricles relax, so the pressure in the aorta and pulmonary artery will exceed the pressure in the ventricles resulting in closure of aortic & pulmonary valves producing the second heart sound (S2)
2. Isometric contraction phase: The ventricles continue to contract while the 4 valves of the heart are closed , so the pressure inside the ventricles rises rapidly without change in the volume	5. Isometric relaxation phase: The ventricles continue to relax while 4 valves of the heart are closed , so pressure inside the ventricles fall rapidly without change in the volume
3. Ejection phase: When the pressure in the ventricles exceeds the pressure in the aorta & pulmonary artery, the aortic & pulmonary valves will open (normally with no sound) Then the blood is pushed from the ventricles to the aorta and pulmonary artery First rapidly: maximum ejection phase Then slowly: reduced ejection phase	6. Ventricular filling phase: When the pressure in the ventricles becomes lower than the pressure in the atria, blood flows to the ventricles passively, • First rapidly: maximum filling phase • Then slowly: reduced filling phase
	7. Atrial systole: • The last amount of blood in the atria is pushed actively by atrial contraction in the late diastole
8. Ventricular contraction: occurs again & the cycle is repeated Any change in the heart rate, is a change in diastole, systole is constant: Tachycardia shortness diastole while Bradycardia lengthens diastole	

► **Auscultation:**

- Stethoscope.
- Site of auscultation.
- The maneuver of auscultation.

Ideal stethoscope:

- Optimal stethoscope tubing length is twelve inches (30 cm)
- Make sure that the earpieces are fit in the external ear.
- Make sure no air leaks occur between the chest wall and the stethoscope earpiece.



The Cone (bell)	The diaphragm
is best listened to low pitched sounds e.g.: S3 / S4 / rumbling murmur of MS.	Identifies high pitched sounds e.g.: normal heart sounds and the murmur of aortic incompetence.

The anatomical sites of valves:

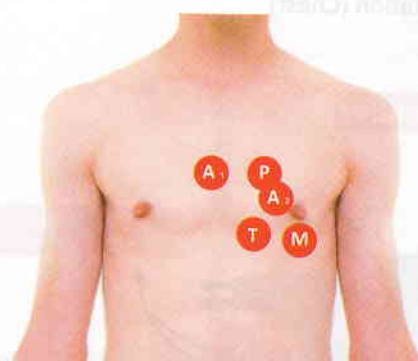
- **P** = 2nd left sternal border.
- **A** = 3rd left sternal border.
- **M** = 4th left sternal border.
- **T** = 5th left sternal border.

Site of auscultation:

- **Mitral:** - apex (lt 5th space at the MCL)
- **Tricuspid:** - at lower end of the sternum
- **Pulmonary:** - left 2nd space
- **Aortic**
 - **A1** = right 2nd space.
 - **A2** = left 3rd space. (Erb's area)

Other rare areas

- Lt Parasternal spaces:- VSD
- Left infra clavicular:- PDA.
- Posterior thorax, T2-T6: coarctation of aorta.

► **N.B.**

Pulmonary & tricuspid valves are anterior
 So, heard at their anatomical sites
 But the **aortic & mitral valves** are posterior
 So, heard at the direction of blood flow.

The maneuver of auscultation:• **Cone**

- Start with the cone of the stethoscope listens to the:
 - Mitral** area
 - Tricuspid** area
- You may need special maneuver as:
Roll the patient on to their left lateral position and listen for the murmur of mitral stenosis.

Auscultating Apex by Cone

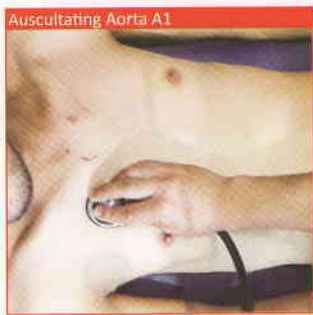
• **Diaphragm**

- Start with mitral area then in a Z shape direction listen to
 - Tricuspid**
 - Pulmonary**
 - Then **aortic** areas.
- You may need special maneuver as:
 - Listen into the **axilla** area for the murmur of **mitral incompetence**.
 - Over **T area** ask the patient to breath in (murmur of right side increased with inspiration)
 - Over **P area** compare between A2 and P2 (S2 of P accentuated in PH++)
 - Over **A area**, listen on the carotid a. (propagation of AS murmur) & ask the patient to set and holding breath in expiration (or hearing of AR)

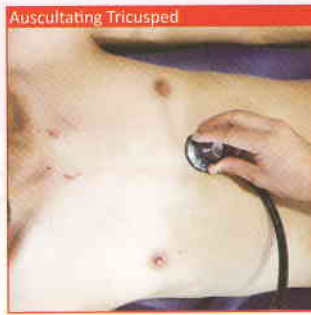
Auscultating Apex by Diaphragm



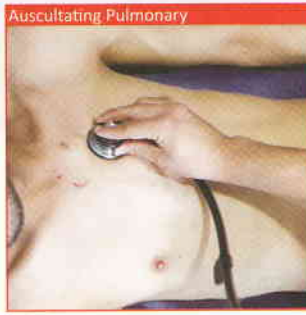
Auscultating Aorta A1



Auscultating Tricuspid



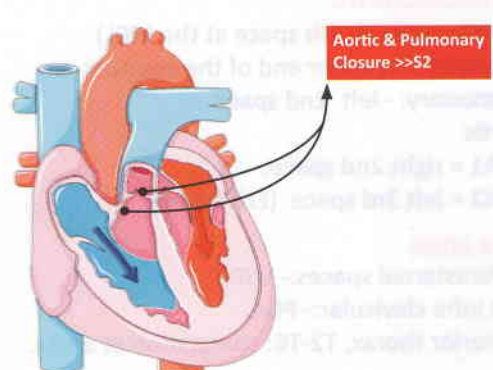
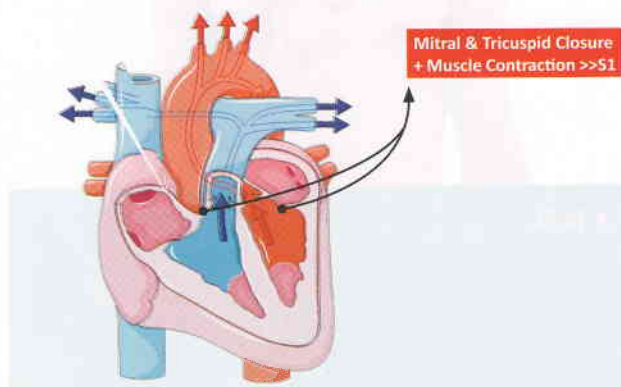
Auscultating Pulmonary

**► Auscultatory findings:****Comment on:**

1. Heard sounds (S1&S2)
2. Additional sounds(S3 S4, EC & OS)
3. Murmurs
4. Pericardial rub
5. Crepitation (Chest)

In each sound comment on

- Def. & mechanism
- Causes
- Site
- Timing
- Character

1. Heart Sounds :

First heart sound		Second heart sound
Formed	Valvular: closure of the mitral and tricuspid valve. Muscular: contraction of the ventricle.	- Closure of the semilunar valves (P & A) - Vibration of the great vessels
Site	Over M & T areas	Over the base (A & p)
Time	At the start of systole (carotid ascend)	At the end of systole (carotid descend).
Accentuated	Thin person, Tachycardia & Children. M.S. = decreased filling of left ventricle = closure of the valve from a lower position. Hyperdynamic states. Short P.R. interval = decreased filling of the heart. S. hypertension = left ventricular +++ (muscular component).	
Weak (Muffled)	Mechanical factor e.g. thick chest wall, obesity emphysema, pericardial effusion. (Distant heart sound). Shock – hypotension	
	M.I. – T.I. (Improper closure). - Severe myocardial diseases or heart failure. - Calcific M.S.	A.I. (Improper closure). A.S. – Severe pulmonary stenosis (Low pressure gradient of closure).
Variable	atrial fibrillation	

► **Tic Tac Rhythm:**

Absence of muscular component of S1 in cases of myocarditis so become only valvular as S2

S1: The **mitral** precedes and louder than **Tricuspid**

S2: • **Aortic** component louder & heard all over the precordium.
 • **Pulmonary** component heard on pulmonary area only.

So the pulmonary component and aortic component heard over the pulmonary area and this is called physiological splitting which increase during inspiration and decrease during expiration.

Splitting of the second H.S.:

- Physiologically the 2nd HS is formed by aortic and pulmonary components
- The aortic valve is closed by pressure greater than that of pulmonary valve. So the aortic valve is closed before the pulmonary valve
- The two component are so closed so heard as a single HS

Normal (physiological) splitting:

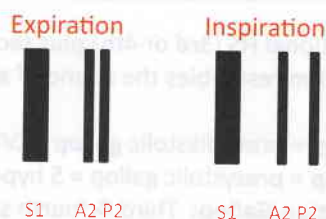
During inspiration the pulmonary flow is increased so the closure of P valve physiologically delayed & lungs expand → retain some blood from Lt. side → ↓ L.V. load and Lt ventricle is strong so early closure of aortic valve occurs

**Wide splitting:**

From the start the P valve is delayed so accepted as two sounds

By inspiration the pulmonary flow is increased so the splitting will be increases

Causes: PS / RBBB / ASD



Paradoxical splitting:

From the start the A valve is delayed so accepted as two sounds

By inspiration the pulmonary flow is increased so the splitting will disappear

Causes: AS / LBBB

Expiration



Inspiration



Fixed splitting:

The second HS formed by two component not changed by inspiration

Causes: A.S.D.:

During Expiration, blood passes from L.A. to R.A.

→ ↑ Load on Rt & ↓ Load on Lt → Aorta closes before Pulmonary;

During inspiration → ↑ Venous return to R.A. which equalize pressure of L.A → Stoppage of shunt, so return to normal physiology (Aorta before Pulmonary)

Expiration



Inspiration



Single S2: Sever P.S. /Sever A.S./ Single ventricle.

Closed splitting: PH++

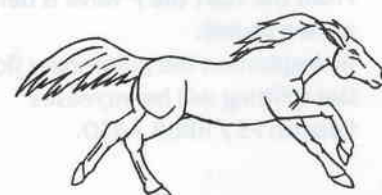
2. Additional Sounds : S3, S4, EC, & OS

	Third heart sound	Fourth heart sound
Def	Low pitched sound heard due to gush of blood from atrium to ventricle or flabby ventricular wall (70 % Passive filling phase)	Low pitched sound heard due to forced atrial contraction against resistance which gush blood to ventricles (30 % atrial contraction phase)
	Physiological: - in children and young adults. V. overload: - MR / AR / TR / VSD / ASD / Hyperdynamic Diminished V distinsability: - LVF \ RVF - Constrictive pericarditis (Pericardial knock)	T. overload : S. hypertension / IHD / A.S. - P.S., P. embolism & PH++
Site	Mitral (left sided causes) or Tricuspid (right sided causes)	
Timing	Early diastolic (protodiastolic)	Late diastolic (presystolic)

Gallop: additional HS (3rd or 4th) plus tachycardia. It is so called because it is a triple rhythm resembles the sound of a galloping horse.

Causes

- S3 gallop** = protodiastolic gallop = LVF (M) / RVF (T)
- S4 gallop** = presystolic gallop = S hypertension & tachycardia
- Summation Gallop:** Third & fourth sounds plus tachycardia in Hypertensive heart failure / IHD



Ejection Click		Opening Snap
Def	Opening of the normal aortic (or pulmonary) valve is soundless while opening of the stenosed aortic (or Pulmonary) valve produces ejection click (a clicky sound) due to doming of this stenosed valve. No ejection systolic click with subvalvular or Calcific A.S.	Snappy sound in M.S due to rigid periphery & pliable centre of the mitral valve in M.S.
Site	Aortic area (A.I.) - A.S. (valvular) S. hypertension. Pulmonary area - P.S. (valvular). - PH ++	Between M & T areas.
Timing	Systolic Ejection Phase	Early diastolic / separated from S2 by the isometric relaxation phase / heard by cone
		Significance: - Diagnostic for M.S. - Non calcified. - Detect severity of M.S. (Diminished distance between O.S. & S2 = sever lesion).
		

3. Murmurs :

Mechanism of Turbulence (murmur):

- Passage of blood through
 - Stenosis (A.S. / M.S / P.S)
 - Irregularity (congenital bicuspid aortic valve)
 - Shunt (VSD / P.D.A.)
- Abnormal direction of Blood (M.R. and A.R.)
- Over blood flow (relative stenosis)
- Passage of blood into a relatively dilated structure (ejection systolic murmur in PH ++ or S hypertension)

Comment on:

- Timing
- Character
- Site
- Propagation
- What increase
- Grading

► Other method: SCRIPT

- Site.
- Character.
- Relation to respiration & position
 - Left sided heart murmurs are louder on expiration.
 - Right sided heart murmurs are louder on inspiration.
- Intensity.
- Propagation.
- Timing.

1. Timing:

- A.S / M.R / T.R. / VSD = systolic.
- A.R./ M.S. = Diastolic.

2. Character:

- A.S. = Harsh.
- A.R. = Soft blowing.
- M.S. = Rumbling.
- M.R. = Soft (80%), harsh = (20%)

3. Site:

According to the diseased valve , A.R. murmur at A2 (Left 3rd I.C. space)

4. Propagation :

- M.R.: Axilla / Sternum & base.
- A.S.: Carotid & Apex.

5. Increased by :

- Mitral murmur:** by
 - Left lateral position.
 - Exercise.
- Aortic murmur:** by
 - Leaning forward.
 - Expiration.
- Right. Sided murmurs:** by Inspiration "Carvallo's sign"

6. Grades (Intensity):

Intensity of a murmur is described in grades as follows:

No Thrill	Grade I	Just audible in a quiet room. (Heard by an expert)
	Grade II	Quiet- (Heard by a non expert)
	Grade III	Loud without thrill. (Easily heard)
Thrill	Grade IV	Loud with thrill.
	Grade V	Very loud with the thrill. (Heard over wide area)
	Grade VI	Audible without a stethoscope. (Extremely loud)

► N.B.

Severity of the lesion detected by **duration** of the murmur not by grad. As duration of murmur depends on the pressure gradient across the valve

► N.B.

Functional murmur: Murmur without structural lesion as overflow or hyperdynamic circulation & usually has no cardiac clinical picture & murmur is faint, soft, localized without thrill

4. Pericardial Rub :

Superficial, gritty, high pitched sound caused by friction of parietal & visceral layer of pericardium. It is best heard at the left of the lower sternum with the patient breathing out using the diaphragm of the stethoscope.

Timing: To & Fro = Systolic & Diastolic.

D.D.:

- Pleural rub:- disappeared by withholding breath
- Friction of stethoscope: disappeared by firm pressure

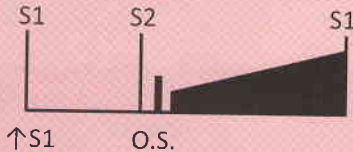
5. Crepitations :

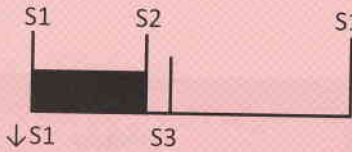
Fine B.B.C.	Medium sized	Coarse
MS – LVF	Chest infection	Acute pulmonary oedema.

Summary of Local examination of valvular diseases

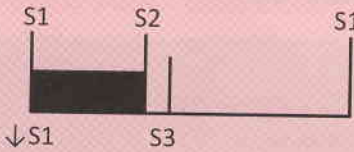
A.S	
Precordial ex.	• Apex: sustained • Chamber ++: LV++ • Thrill: systolic (A1)
Auscultation	• H.S.: S2 ↓ • Murmur: • Ejection systolic • Harsh • Over A1 • Propagated: apex and carotid طالع تازل • increase by leaning forward & expiration • EC & S4

A.R	
Precordial ex.	• Apex: Hyperdynamic • Chamber ++: LV++
Auscultation	• H.S.: S2 ↓ • Murmur: • Early diastolic • Soft blowing • Over A2 • Increase by expiration • S3 + peripheral signs

M.S	
Precordial ex.	• Apex: Slaping • Chamber ++: L.A. • Thrill: Diastolic & palpable S1
Auscultation	• H.S.: S1 ↑ • Murmur: • mid-diastolic with presystolic accentuation which lost in AF • Rumbling • At or inside the apex • localized • Increased by Left lateral or exercise • OS
	

M.R.	
Precordial ex.	• Apex: hyperdynamic • Chamber ++: LV++ • Thrill: Systolic (Over Mitral)
Auscultation	• H.S.: S1 ↓ • Murmur: • pansystolic • Soft (80%) / Harsh (20%) • Over M (apex) • Propagated: Axilla (ant. Leaflet) and Sternum (post. Leaflet) • Increased by Left lat / exercise • S3
	

► Diagnosis :

T.R.	
Precordial ex.	• Apex: hyperdynamic • Chamber ++: RV++ • Thrill: Systolic (Over Tricuspid)
Auscultation	• H.S.: S1 ↓ • Murmur: • pansystolic • Soft • Over T (apex) • Increased by inspiration (sign) • S3
	

The diagnosis should include the following four categories:

Aetiological:

- Rheumatic: multivalvular – history of rheumatic fever.
- Congenital: since birth + anomalies.
- Ischemic.
- Hypertensive.
- Surgical.

Anatomical:

- Valve lesion.
- Pericardium: constrictive pericarditis.
- Myocardium: cardiomyopathy.

Pathological:

- Stenosis. Or
- Regurge. Or
- Double.

Functional:

- **Compensated:** no manifestations of LVF or RVF.
- **Non-compensated:** manifestations of LVF or RVF.
- Or **complicated by:**
 - A.F. or any arrhythmia.
 - Embolic manifestations e.g. hemiplegia.
 - Infective endocarditis.
 - Chest infection.

Examples of diagnosis:

- Rheumatic heart disease (M.S. – M.I.) compensated, non-complicated.
- Rh. Heart disease (M.I. – A.I.) left sided heart failure complicated with infective endocarditis.
- Congenital Heart disease (V.S.D.) compensated

INVESTIGATIONS IN CARDIOLOGY

Scheme for investigations1. **Laboratory:** Urine/ stool/ blood/ others.2. **Images:**

- X ray :- Plain or with Contrast
- Echocardiography & Doppler.
- C.T. / MRI. (limited for pericardial diseases or tumours)

3. ECG

4. **Nuclear medicine** as isotopic scan (for IHD)5. **Endoscopy**6. **Catheterization**7. **Biopsy****Laboratory:**

Indication	Values
Arthralgia	For diagnosis of Rheumatic fever.
Fever	For diagnosis of infective endocarditis.
Pallor	For diagnosis of anemia.

ECG:

Indication	Values
All Cardiac cases	• Chamber enlargement (hypertrophy). • Arrhythmia as A.F. • Ischemia (angina & M.I.).

Images:**A. X ray:**

Plain		With contrast (Br. Swallow)	
Indication	Values	Indications	Values
All Cardiac cases	• Chamber enlargement. • Pulmonary vasculature. • Calcific valve.	Mitral valve disease	LA ++

B. Echocardiography & Doppler

Investigation of choice: - simple, cheap, available, non invasive & highly diagnostic.

Echocardiography		Doppler
Indication	Values	Values
All Cardiac cases	1. Aetiology: Rh(excessive fibrosis) congenital (ASD – VSD) 2. Lesions: which valve. 3. Severity: see later. 4. Effect: chamber ++. 5. Complications: • PH+++. • Calcification. • Thrombosis. 6. Function: Ejection fraction = Stroke volume / end diastolic volume	For blood flow: • Direction: • Regurge. • Pressure: PH ++. • Velocity.

MS	Valve area (normal = 4-6 cm ²) Tight MS = < 1 cm ²
AS	Pressure gradient (normal = 0 mmHg) Sever AS = > 50 mmHg
Any regurge	Degree of dilatation & EF

► N.B.**Trans-esophageal echo (TEE):**

- Heart thrombus.
- Vegetation.

Catheterization

It is a long, elastic, radio-opaque, thin cord like with a central lumen.

Pathway:

Right sided catheter	Left sided catheter
Any vein → I.V.C. → R.A. → tricuspid valve → Rt. Vent. → Pulmonary artery.	Any artery → aorta → aortic valve → left ventricle.
	Mitral valve: As right sided → RA → artificial ASD → LA → M valve

Values: As Echo & Doppler but superior in IHD

TREATMENT IN CARDIOLOGY

Medical	Interventional	Surgical
Treatment of the cause of possible. Prophylaxis: - For rheumatic fever → to prevent recurrence of activity which is usually fatal (causes myocarditis, develops new lesion or increases severity of present lesions). - For infective endocarditis. Symptomatic: - Treatment of AF. - Treatment of HF. - Treatment of thrombosis. Curative - Only in cases of AR by: Vasodilators to reduce the peripheral resistance and prevent blood regurge though the aorta.	Recent less invasive by catheterization. - In cases of stenosis → ballooning dilatation. (Balloon valvoplast) - In cases of IHD → coronary angioplasty	Indications: - Failure of medical treatment. - Severe cases. - Complicated cases. Includes: 1. Mitral valvotomy of MS Isolated MS – non calcific valves. May be complicated by : - Restenosis - iatrogenic MR. 2. Valve repair in regurge: usually failed. 3. Valve replacement: Tissue valve: - Short life span. - No anticoagulant. Used for: - Old age. - Female in child bearing period. Prosthetic valve: - Long life span. - Anticoagulant needed. May be complicated by: - Dysfunction. - Hemolytic anemia. - Endocarditis.

Heart surgery:

	Opened heart surgery (OHS)	Closed heart surgery (CHS) (in the past)
Technique	Heart lung machine → used Needs high experience.	Not used Simple.
Mortality	High	Low
Scar	Median sternotomy	Lateral inframammary scar
	The other cases.	Mitral valvotomy in cases of M.S. - Isolated. - Not calcified.

► **Valve replacement:****Which valve is replaced?**

- From History.
- Metallic H.S.
 - S1 = Mitral.
 - S2 = Aortic.

Function of the replaced valve:

- No symptoms or signs of the disease.
- Local examination i.e. no murmur.

Complications of the replaced valve:

- Dysfunction
- Haemolytic anemia.
- Haemolytic jaundice.
- Prosthetic valve endocarditis
- anticoagulant use

VALVULAR HEART DISEASES

Mitral stenosis (MS)

Etiology:

- **Rheumatic fever:** (the most common cause).
- **Congenital:** rare
- **Relative stenosis** (not an organic stenosis)
 - Increased blood flow through the mitral valve.
 - Carey-coombs murmur in acute rheumatic valvulitis.
 - Austin flint murmur in severe aortic regurgite.

Pathophysiology:

- **In mild cases:** No symptoms occur.
- In severe cases: (valve area less than 2 cm²): Blood stagnate in pulmonary veins (pulmonary venous congestion).
- **Later on:** Vasoconstriction of pulmonary arterioles occurs to ↓ pulmonary congestion, but this will lead to: pulmonary hypertension.
- **Finally:** RV enlargement & then RVF will occur secondary to pulmonary HTN.

Therefore four stages will occur in patient with MS:

- **Stage one:** "Mild or asymptomatic mitral stenosis" The only abnormality is anatomical narrowing of the mitral valve, but the patient is fully compensated (no symptoms).
- **Stage two:** "mitral stenosis with pulmonary congestion" The pulmonary venous pressure is elevated.
- **Stage three:** "mitral stenosis with pulmonary hypertension" The pulmonary arterial pressure is elevated.
- **Stage four:** "mitral stenosis with right ventricular failure"

Clinical picture:**Symptoms:**

- **Stage one:** No symptoms.
- **Stage two:**
 - Symptoms of pulmonary congestion (but pulmonary oedema is not common).
 - Symptoms of low CO.
- **Stage three:**
 - Symptoms of pulmonary congestions: improve.
 - Symptoms of Low CO: increase.
- **Stage four:**
 - Symptoms of systemic congestion.
 - Dyspnea is the most common symptom

Signs:**General:**

- **Stage one:** No signs.
- **Stage two:** signs of pulmonary congestion (BBC).
- **Stage three:** signs of low cardiac output.
- **Stage four:** signs of systemic congestion.

Precordial examination:

- **Stage one & stage two:**
 - Apex: normal site & slapping character.
 - Diastolic thrill: ending in a palpable S1.
- **Stage three & stage four:**
 - The previous findings.
 - Signs of: pulmonary hypertension.
 - Signs of: right ventricular enlargement.

Auscultation:

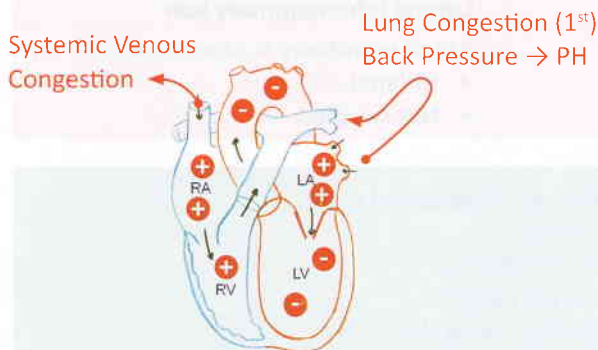
- **Stage one & stage two (over the mitral area):**

Accentuated first heart sound: due to:

- Fibrosis of the mitral cusps.
- Forcible closure of the mitral cusps: because:
- They are displaced downwards due to high LA pressure.
- The mitral valve is opened as wide as possible during the diastole.

► N.B.**Diminished S1 in mitral stenosis denotes:**

- Double mitral lesion (with predominant regurge) or
- Calcified mitral valve.



Mitral opening snap: It is sharp & snapping due to opening of the rigid cusps of mitral valve. It heard in the early diastole. Just after S2 (separated from it by the isometric relaxation phase). Just before the murmur of mitral stenosis. Its presence diagnostic for mitral stenosis and can detect Severity & denotes noncalcification of the mitral valve.

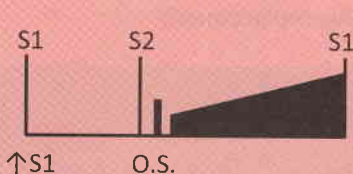
Murmur of mitral stenosis:

- **Timing:** Mid-diastolic pre-systolic with pre-systolic accentuation.
In AF, there is loss of pre-systolic accentuation (due to loss of atrial contraction) & S1 became variable.
- **Character:** rumbling.
- **Site:** at or slightly inside the apex.
- **Propagation:** not propagated.
- **Position:** Best heard with the cone of the stethoscope. in the left lateral position.

Silent mitral stenosis: (MS with no murmur) due to:

- High LV pressure: LVF.
- Low LA pressure:
- Severe pulmonary hypertension.
- RVF.
- In association with ASD.
- **Stage three:**
The previous findings.
Auscultatory findings of **pulmonary hypertension:**
Over the pulmonary area:
 - P2 is accentuated.
 - Systolic ejection click.
 - Systolic ejection murmur (Functional PS)
 - Soft early diastolic murmur: (Graham Steel murmur = Functional PI)
- **Over the tricuspid area:**
 - S4 gallop
- **Stage four:**
The previous findings.
Auscultation over tricuspid area:
 - Pan systolic murmur of functional tricuspid regurge.
 - Ptdiastolic gallop (S3) due to RVF.

Summary of Local Examination:

M.S	
Precordial ex.	• Apex: Slapping • Chamber ++: L.A. • Thrill: Diastolic & palpable S1
Auscultation	• H.S.: S1 ↑ • Murmur: • mid-diastolic with presystolic accentuation which lost in AF • Rumbling • At or inside the apex • localized • Increased by Left lateral or exercise
	

► Complications:

- **In the mitral valve:**
 - Rheumatic activity.
 - Calcification.
 - Infective endocarditis.
- **In the left atrium:**
 - LA enlargement, causing symptoms (**Pressure symptoms**)
 - Arrhythmias, especially AF.
 - Thrombo-embolic complications
- **In the right ventricle:**
 - RVF.
- **In the lung:**
 - Hemoptysis.
 - Pulmonary infection.
 - Pulmonary embolism (secondary to DVT).
 - Pulmonary oedema is not common in mitral stenosis.
- **Complications of Treatment.** Traumatic MR, Complications of general anaesthesia, Complications of anticoagulants)

Investigations

- Chest X-ray:
- ECG
- Echocardiography:

The most sensitive & specific non-invasive method diagnosing MS.

Detects the severity of stenosis.

Detects chamber enlargement.

- Cardiac catheterization & angiocardiography:

Tight MS is diagnosed:

- **According to the stage:** Stage two with dyspnea more than grade two, or Stage three, or Stage four.
- **According to the echocardiography:** Valve area less than 1 cm².

Treatment**Medical:**

- Prophylaxis against: rheumatic activity, infective endocarditis (uncommon).
- Symptomatic for: complications e.g. HF, AF, infection, embolization.

Surgical:**Indications:**

- Tight mitral stenosis (valve area is < 1 cm²).
- Marked symptoms not responding to adequate medical treatment.
- Embolization with no serious deterioration of the condition of the patient.

Types of operations:

- Mitral commissurotomy: closed or open:
- Valve replacement

Mitral Regurge (MR)

Etiology:**Organic:**

- Rheumatic fever: the most common cause.
- Congenital.
- Prolapse of the mitral valve (MVP)
- Papillary muscle dysfunction e.g. CAD.
- Infective endocarditis.
- Iatrogenic: following mitral valvotomy.

Relative:

- Dilatation of the mitral ring secondary to LV dilatation.

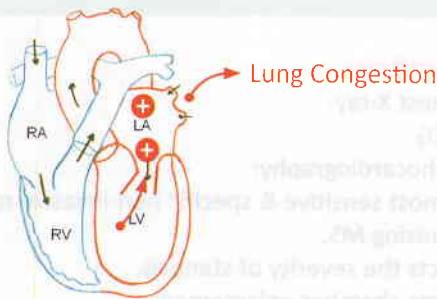
pathophysiology:**During systole:**

A part of blood regurgitates from LV to LA leading to:
Low CO.

LA dilatation: due to increased blood volume in LA.

During diastole:

A large volume of blood → LV → LV enlargement
which may end in LVF.

**Clinical picture:****Symptoms:**

- No symptoms: in early cases.
- Symptoms of low cardiac output: in late cases.
- Symptoms of pulmonary congestion: in late cases.
- **PALPITATION (Most Common)**

Signs:**General:**

- No signs: in early cases.
- Signs of low cardiac output: in late cases.
- Signs of pulmonary congestion: in late cases.

Precordial examination:

- Signs of LV enlargement: with hyperdynamic apex.
- Systolic thrill: over the apex.

Auscultation:

- **First heart sound:** weak (muffled) due to failure of proper mitral closure.
- **Third heart sound:** present due to excessive flow of blood from LA to LV.

Murmur of mitral regurge:

- **Timing:** pansystolic starting with S1.
- **Character:** soft or harsh.
- **Site:** over the apex.
- **Propagation:**
 - To the axilla.
 - To the base of the heart & medially in posterior leaflet disease.
- **Position:** heard best in the left lateral position.

Summary of Local Examination:

M.R.	
Precordial ex.	• Apex: hyperdynamic • Chamber ++: LV++ • Thrill: Systolic (Over Mitral)
Auscultation	• H.S.: S1 ↓ • Murmur: • pansystolic • Soft (80%) / Harsh (20%) • Over M (apex) • Propagated: Axilla (ant. Leaflet) and Sternum (post. Leaflet) • Increased by Left lat / exercise • S3

complications:

- Same complications of MS, but:
 - Infective endocarditis: is common.
 - Left ventricular failure: occurs.

Investigations:

- Chest X-ray:
- ECG:
- Echocardiography:
 - Detects the severity of mitral regurgitation.
 - Detects chamber enlargement.
 - Detects the cause: e.g. MVP.
- Cardiac catheterization & angiography:

Treatment:

- Medical: Same as that of mitral stenosis.
- Surgical: Valve replacement.

► N.B. Causes of acute Mitral Regurge:

- Post valvotomy (Traumatic)
- Infective endocarditis affecting valve leaflets
- Ischemia affecting chorda tendineae (MI)

Aortic Stenosis (AS)

Etiology:

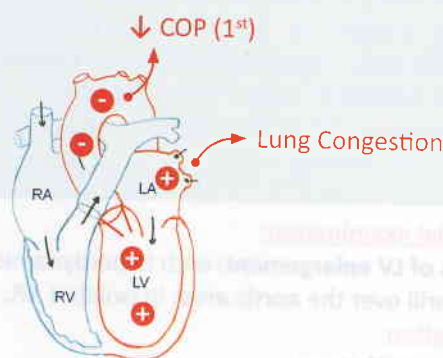
- Rheumatic fever.
- Calcific.
- Congenital:
it may be: **valvular**, **subvalvular** or **supra-ventricular**.
Hypertrophic cardiomyopathy (Idiopathic Hypertrophic Subaortic Stenosis; IHSS):
It produces a subvalvular obstruction in the systole due to: contraction of the hypertrophied interventricular septum.
- Relative stenosis (not an organic stenosis):
 - Dilatation of the aorta:
 - Hypertension, atherosclerosis, aortic aneurysm.
 - Increased blood flow across the aortic valve: Hyperdynamic circulation, AR.

Pathophysiology:

During systole, there is obstruction of blood flow from LV to aorta leading to:

- Low cardiac output.
- Pressure overload on LV leading to LVH & LVF.

Normally, the aortic valve area is 3 – 4 cm². In severe AS, it is less than 0.8 cm².

**Clinical picture:****Symptoms:**

- No symptoms: in mild cases.
- Symptoms of low CO: in severe cases.
- Symptoms of pulmonary congestion: due to LVF.
- **SYNCOPE**: especially exertional due to low fixed CO.
- **ANGINA**: due to
 - Reduced coronary blood flow: due to low CO & shortened diastole.
 - Left ventricular hypertrophy: increases the myocardial O₂ demands.
 - Associated coronary atherosclerosis: especially in calcific AS.

Signs: General:

- **Pulse:**
Pulsus parvus et tardus (**plateau pulse**): rises slowly, of small volume, returns slowly.
Pulsus bisferiens: bifid pulse occurring in double aortic lesion.
- **BP**: low SBP in severe cases.
- **Systolic thrill**: over the carotid arteries.

Precordial examination:

- **Signs of LVH**: with a heaving apex.
- **Systolic thrill**: over second right space propagated to apex & carotid arteries.

Auscultation:**Over the aortic area:**

- Second heart sound: weak.
- Systolic ejection click: due to opening of the rigid cusps.
- **Systolic ejection murmur**:
Midsystolic, harsh.
Maximum over second right space propagated to apex & carotid arteries.

Over the pulmonary area:

Reversed splitting of the second heart sound.

Over the mitral area:

- S₄.
- Propagated murmur of AS.

Summary of Local Examination:

A.S	
Precordial ex.	• Apex: sustained • Chamber ++: LV++ • Thrill: systolic (A1)
Auscultation	• H.S.: S₂ ↓ • Murmur: • Ejection systolic • Harsh • Over A1 • Propagated: apex and carotid • increase by leaning forward & expiration

complications:

- LVF.
- Infective endocarditis.
- Sudden death: usually due to VF.
- Heart block: in calcific AS due to extension of calcification to AV bundle.
- Rh. Activity with Rh. A.S.

Investigations:

- Chest X-ray, ECG. Echocardiography, Cardiac catheterization & angiocardiography:

Treatment:

- **Medical**: Same as that of mitral stenosis.
- **Anginal attacks**: may be relieved by SL nitrates.
- **Surgical**: (Aortic valve replacement)
- **Balloon dilatation**: Children & Elderly

Aortic Regurge (AR)

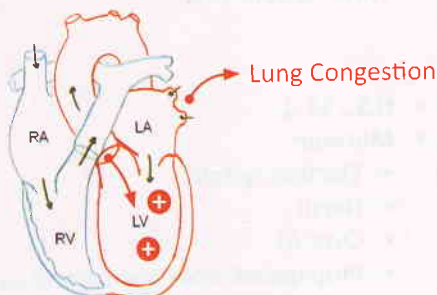
Etiology:

- **Rheumatic fever:** the most common cause.
- Infective endocarditis.
- Congenital.
- **Dilatation of the ascending aorta as in :**
 - Syphilic aortitis: syphilis produces dilatation of the aortic ring.
 - Severe hypertension.
 - Ankylosing spondylitis.
 - Aortic aneurysm: with dissection.
 - **Marfan's syndrome.**

Pathophysiology:

Regurgitation of blood from the aorta to the LV in diastole leads to:

- Increased LV stroke volume, this results in:
 - Increased SBP.
 - Peripheral VD which (together with regurgitation) will decrease the DBP.
 - $\uparrow$ SBP & $\downarrow$ DBP $\rightarrow$ wide pulse pressure causing peripheral signs of AR.
- Volume overload on the LV leading to LV dilatation & later on LVF.



Clinical picture:

Symptoms:

- Generalized body throbbing: due to increased arterial pulsation.
- Palpitation: due to forcible LV contraction.
- Symptoms of pulmonary congestion: when LVF occurs.
- Angina pectoris: "two types of angina occur in aortic regurge"
 - **Classic angina of effort :** Decreased DBP: reduces coronary filling.
 - **Angina of Lewis:** Nocturnal & associated with autonomic disturbance e.g. sweating & tachycardia.

Signs:

General: "Peripheral signs of aortic regurge"

Peripheral signs of aortic regurge:

4 head and neck, 3 upper limb and 3 lower limb
4 head and neck

- De-Musset sign: nodding of the head.

- Corrigan's sign: prominent carotid pulsations.
- Systolic thrill: over the carotid arteries.
- Arteriolar pulsation: seen by fundus examination
- muller's sign: pulsating uvula + capillary pulsations by fundus exam

3 upper limb

- Water hammer pulse: Raises rapidly, of big volume, collapses rapidly.
- Blood pressure: Wide pulse pressure: exaggerated differences between systolic and diastolic blood pressure.
- Capillary pulsations: detected in nail bed, lips or ear lobule.

3 lower limb

- **Pistol shots:** loud booming sounds heard with each pulse beat over the arteries (especially femoral) due to sudden distension of collapsed arteries.
- **Duroziez's sign:** It consists of systolic & diastolic murmurs over the femoral artery if it is slightly compressed with the stethoscope bell. The systolic murmur is due to the rapid flow of blood to periphery, while the diastolic murmur is due to rapid regurge of blood to the heart.
- **Hill's sign:** Exaggerated difference between SBP in LLs & ULs: more than 50 mmHg. Normally, SBP in LLs is higher than in ULs: by about 10 – 20 mmHg.

Precordial examination:

- **Signs of LV enlargement:** with hyperdynamic apex.
- No thrill over the aortic area: in isolated AR.

Auscultation:

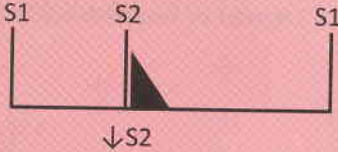
Over the aortic area:

- Normal second heart sound.
- **Murmur of AR:**
 - **Timing:** early diastolic.
 - **Character:** soft blowing, decrescendo.
 - **Site:** maximum over the third space.
 - **Propagation:** to the apex.
 - **Position:** best heard with the diaphragm of the stethoscope, the patient is:
 - Sitting up.
 - Leaning forward.
 - Holding his breath in forced expiration.
- **Soft ejection systolic murmur:**
 - Due to $\uparrow$ blood flow across the aortic valve (relative AS).

Over the mitral area:

- S3.
- Propagated murmur: of AR.
- Pan systolic murmur: of functional MR.
- Austin Flint murmur: (mid-diastolic) due to:
- Elevation of anterior leaflet of the mitral valve by the regurgitant blood from the aorta causes relative MS.

Summary of Local Examination:

A.R	
Precordial ex.	• Apex: Hyperdynamic • Chamber ++: LV++
Auscultation	• H.S.: S2 ↓ • Murmur: • Early diastolic • Soft blowing • Over A2 • Increase by expiration
	

Complications:

- Rheumatic activity.
- Infective endocarditis.
- LVF.

Investigations:

- Chest X-ray: "Aortic configuration (Boot-shaped heart)"
- ECG:
- Echocardiography:
- Cardiac catheterization & angiocardiography:

Treatment:

- Medical:
 - Same as that of mitral stenosis.
 - Syphilis: anti-syphilitic treatment.
- Surgical: (aortic valve replacement)

Marfan's syndrome**Definition:**

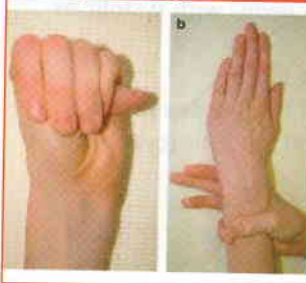
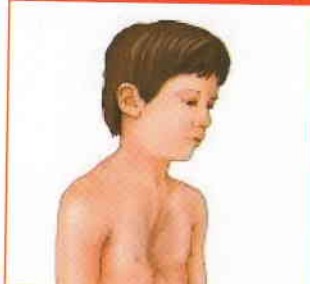
Multisystem connective tissue disorder autosomal dominant trait characterized by systemic affection.

Features:

1. Positive family history
2. Skeletal manifestations:
 - Long bone disproportionate tall stature
 - Short bone: arachnodactyly (long slender finger)
- proved by:
 - Thumb test & Wrist test
- High arched palate
- Flat foot & pes planus
- Pectus excavatum or carinatum
- Kyphoscoliosis
3. Eye: subluxation of lens, ectopic lentis
4. Chest: cystic diseases
5. Cardiovascular:
 - Aortic aneurysm
 - Dilated ascending aorta > AR
 - Mitral valve prolapse > MR

DD:

- **Marfanoid feature:** skeletal manifestation only
- **Homocystinuria**
 - Patient have many symptoms and signs as tall stature & ectopic lens
 - Aortic aneurysm is not a feature
 - Inheritance is recessive
- **Familial thoracic aortic aneurysm syndrome:** Has many feature of Marfan syndrome + autosomal dominant trait
- **MASS phenotype:**
 - Has many feature of Marfan syndrome
 - But follow a more benign course

Thumb Sign & wrist sign**High arched palate****Arachnodactyly****Span > Height****Pectus Excavatum**

Tricuspid Regurgitation (TR)

Etiology:

- **Functional:** the most common cause due to dilatation of the tricuspid ring secondary to RV dilatation.
- **Organic:** rare:
 - Rheumatic fever.
 - Infective endocarditis.
 - Congenital.
 - Carcinoid syndrome.

Pathophysiology:

- During systole, blood regurgitates from RV to RA causing:
- Low CO.
- RA enlargement.
- RV enlargement.66
- RVF (systemic congestion).

Clinical picture:

Symptoms:

- Systemic congestion.
- Low CO.

Signs:

General:

- **Systemic congestion including:**
 - Congested pulsating neck veins: with systolic expansion.
 - Enlarged tender pulsating liver.
 - Ascites before oedema of LLs (Ascites precox).
 - Mild jaundice & peripheral cyanosis (cyano-icteric face).
- **Low CO.**

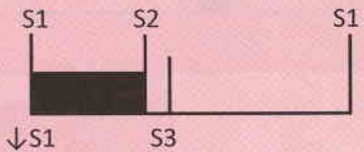
Precordial examination:

- RA & RV enlargement.
- Rarely: systolic thrill over tricuspid area.

Auscultation: "over tricuspid area"

- Weak muffled S1.
- S3.
- Pan systolic murmur.
 - Timing: pan systolic.
 - Character: soft or harsh.
 - Site: tricuspid area.
 - Propagation: to the apex, but not to the axilla.
- **Caravall's sign:** murmur increases with inspiration being of right side origin.

Summary of Local Examination:

T.R.	
Precordial ex.	• Apex: hyperdynamic • Chamber ++: RV++ • Thrill: Systolic (Over Tricuspid)
Auscultation	• H.S. : S1 ↓ • Murmur: • pansystolic • Soft • Over T (apex) • Increased by inspiration (Carvallo's sign) • S3
	

Investigations:

- Chest X-ray
- ECG
- Echocardiography
- Cardiac catheterization & angiocardiography

Treatment:

- Medical: Treatment of right sided heart failure.
- Surgical: Valve replacement.

As a medical doctor, it is my duty to evaluate the situation with as much data as I can gather and as much expertise as I have and as much experience as I have to determine whether or not the wish of the patient is medically justified.

Jack Kevorkian



CONGENITAL HEART DISEASE:

Classifications

Cyanotic

- Fallot's tetralogy
- Fallot's triology
- TGA
- Eisenmenger's Syndrome

Acyanotic

- Right Ventricle:
 - A: ASD
 - P: PS
- Left Ventricle:
 - A: AS
 - P: PDA
 - C: Coarctation
- Biventricular: **VSD**
- No ventricle: **Dextrocardia**

Generally CHD characterized by:

- Murmur since birth
- Cyanosis since birth
- No history of Rheumatic Fever
- Infant with recurrent chest infection
- HTN in child:
 - GN
 - Coarctation of aorta
- +ve Family history ±
- Growth failure & poor feeding

Incidence:

0.5 – 0.8 % of children

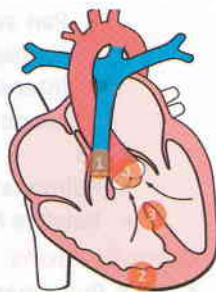
Risk factors:

- Maternal:
 - **Drugs:** Alcohol
 - **Diseases:**
 - Rubella
 - DM
- Chromosomal:
 - **Down's Syndrome:** VSD
 - **Turner's:** Coarctation of A

Fallot's Tetralogy

Components:

1. **Pulmonary Stenosis**
 - 50% infundibular
 - 10% valve
 - 30% both
2. **RVH (mild)**
3. **VSD (large & nonfunctioning)**
4. **Overriding of aorta**



Haemodynamics:

degree of PS detect degree of Rt. to Lt. shunt

- **Sever PS** → Rt. to Lt. → 1st week cyanosis
- **Moderate** → balanced shunt → delayed cyanosis (within months)
- **Mild** → Lt. to Rt. → ↑ Pul. BL. Flow → ↑ liability to HF → within time → PS ↑↑ → Lt. to Rt. shunt ↓ → cyanosis & spells

► N.B.

Pulmonary Blood Flow is maintained in by PDA in neonates

Clinical Picture:

1. **Central cyanosis**
2. **Blue Clubbing**
3. **Squatting position**

4. Paroxysmal hypercyanotic spells:

- Infundibular spasm **due to:**
 - Crying
 - Feeding
 - defecation

Presented by:

- ↑ cyanosis
- Convulsion
- Cardiac arrest
- Hyperapnea (rapid, deep breathing) → respiratory acidosis

5. **Growth Retardation**6. **Neck vein:** despite PS there's no gaint A wave 😊7. Cardiac examination:

- Normal Ht. size or mild Rt.V++
- Systolic thrill & murmur over pulmonary Area
- Single S2 (A2 only)

Complications:

- Brain abscess
- Pulmonary T.B.
- Infective Endocarditis
- Thrombosis
- HF → rare → may be with pink fallot's

Investigations:

- **X-ray:**
 - Oligemic lung
 - **Coeur en sabot** (boat shaped Ht.):
 - Narrow base, exaggerated waist & outward shifted apex
- **ECG:** Rt.V++
- **Echo:** Diagnostic
- **Catheter:** Pre-operatively
- **ABG:** hypoxia
- **CBC:** polycythemia

**Treatment:****Medical:**

- **Cyanotic spells:**
 - Squating position
 - Na HCO₃
 - Propranolol 0.1 mg/kg IV.
 - Morphine 0.1 mg/kgsc. To suppress R.C.

- **Thrombosis:** exchange transfusion

- **Prophylaxis against IE**

Surgical:

- **Blalock – Taussing operation**

Anastomosis between Aorta & Pulmonary

(subclavian & Ipsilateral pulmoary artery) as PDA

- **Total correction**

Fallot's trilogy (F3)

- PS (valvular)
- Rtv ++ (marked)
- ASD

Ventricular Septal Defect (VSD)

Definition: Defect in interventricular septum

Types: • **Size:**

- < 0.5 cm → small
- 0.5 – 1 cm → medium
- > 1 cm → large

• **Site:**

- **Membranous 70%**
- **Ventricular 30%**

Haemodynamics:

Blood from Lt. to Rt. → ↑ pulmonary Blood Flow
→ ↑ input to Lt. At. → Lt.V.F.

Long standing ↑ Pulmonary blood flow → VC → PH++ → Reversal of shunt Eisenmenger's Syndrome & Rt.V.F.

Clinical Picture:

- **Small:** asymptomatic
- **Large:**
 - Pulmonary Congestion
 - Heart failure (Lt. then Rt. side HF)

- **Heart:**

- Biventricular ++
- Thrill (Systolic in Lt parasternal area)

- **Murmur:**

- Pan systolic harsh on Lt 3rd & 4th spaced propagated to all over the precordium .
- Intensity of murmur is indirectly proportionated with the size of VSD

- S3
- Pulmonary Hypertention
- Relative Ms

Complications:

- HF & Pulmonary infection
- IE & Eisenmenger's

Investigations:

- Chest X-ray
- ECG
- Echocardiography

Treatment:

- Medical: Prophylactic & Symptomatic
- surgical



NOW,

you are provided and skilled with Knowledge and skills essential to take full cardiology sheet; History, Local & general Examination...

In the next page, you'll find an example of cardiology sheet...

practice under supervision & Good Luck

LONG CARDIOLOGY CASE

► History :

Personal history:

Mr. xxxx 41 years old, from Giza, driver, married 21 years ago and has 3 daughters, the youngest is 2 years old, he is moderate smoker.

He is complaining of: shortening of breathing of 1 week duration.

History of present illness:

patient was quiet well until he suffered from an exertional dyspnea of gradual onset and progressive course with 10 years duration.

This dyspnea increased by exercise and decreased by rest, treated by digoxin but recurrent, No orthopnea or P.N.D.

No cough, haemoptysis or recurrent chest infection. 3 years later he developed regular palpitation of gradual onset and progressive course, increased by exercise & decreased by rest.

2 months ago palpitation became irregular without precipitating or relieving factors.

No symptoms of systemic venous congestion.

No cyanosis, no symptoms of low cardiac output or syncope.

No chest pain, pressure manifestations, B.P. changes, fever or embolic manifestations.

No symptoms of other systems affection.

Patient investigated by E.C.G., chest X-ray, Echo cardiography and Doppler and treated by digoxin, marivan and lasilacton.

Past history of rheumatic fever at age of 7, manifested by fever, polyarthritis and skin rash, investigated by blood analysis and treated by aspirin long acting penicillin every month without compliance.

Past History:

No history of surgical operation, allergy, or drugs intake.

Family History:

Irrelevant family history.

► General Examination :

- Patient with an average general condition. patient is fully conscious, oriented by time, place and persons, with good mood and memory; he is co-operative with an average inelegancy.
- Average built, Patient lies comfortable in bed.
- Body temperature: 37.1 °C.
- No pallor, jaundice or cyanosis.
- Neck:
 - Not congested neck veins.
 - Normal carotid pulsation.
 - Central trachea.
 - No thyroid or lymph node enlargement.

Upper limbs:

- **Pulse:** 85 beats / min., irregular, variable volume, equal in both sides, pulse deficit > 10 / min., condition of blood vessels are normal with palpable dorsalis pedis.
- Blood pressure = 110 / 70.
- No hand clubbing.

Lower limbs:

- No lower limb edema.
- Intact peripheral pulsations.

Local Examination :**By Inspection:**

- No precordial bulge.
- No scars.
- No dilated vein or pigmentations.
- Visible apical pulsation.

By Palpation:

- **Apex:**
 - Site: left 5th I.C. / M.C.L.
 - Area: localized.
 - Character: hyper dynamic.
 - Thrill: systolic thrill.

By Percussion:

- Hepatic dullness in 5th I.C. space.
- No dullness outside right border of the heart.
- No dullness on base of the heart.
- No dullness outside the apex.
- No sternal dullness.

By Auscultation:

- **Of Apex:**
 - Variable S1.
- **Murmur:**
 - Pansystolic.
 - Soft.
 - On apex.
 - Propagated to axilla.
 - 2/2 by exercise.

Of Tricuspid area:

- Variable S1.
- No murmur.

Of Base:

- Normal S2.
- No murmur.
- No additional sounds or crepitation.

Proper Diagnosis :

A case of rheumatic valvular heart disease, most probably M.S. & M.R. Patient is compensated but complicated by A.F.



CHEST

||

Rare presentations of common diseases are much more common than common presentations of rare diseases.

||

INTRODUCTION

► Surface anatomy of the chest:

Trachea:

From **6th cervical vertebra** to **4th thoracic vertebra** (angle of Lewis).

10 cm length (upper ½ in the neck and lower ½ in the chest). Ended by 2 bronchi (**Carina Angle**)

Normal Trachea is **slightly shifted to the right** due to presence of the arch of aorta.

lungs:**1. Apex:**

Represented by curved line, a point **3 cm above the medial ½ of the clavicle**.

2. Anterior border:

Represented by a line drawn downwards and medially from the **sterno-clavicular joint** to the **sternal angle** near the midline, then:

In the **right lung**: it extends vertically downwards to the **6th sternocostal junction**.

In the **left lung**: it extends vertically downwards to the level of the **4th costal cartilage**, where it curves laterally for 3.5 cm and then downwards and medially to reach the **6th costal cartilage 4 cm from the midline**.

3. Inferior border:

Represented by a line drawn laterally and backwards cutting the following ribs:

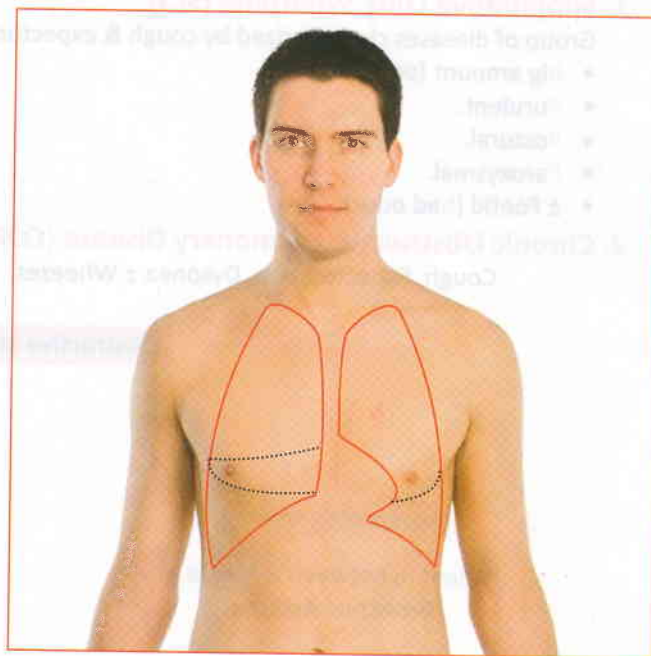
6th rib, at the **midclavicular line**.

8th rib, at the **midaxillary line**.

10th rib, at the **scapular line**.

4. Posterior border:

Represented by a vertical line drawn from the posterior end of the inferior border up to the apex of the lung.

**► N.B.**

Surface anatomy of the pleura: the same as lung by add 2 ribs over the inferior border of the lung.

Lung fissures:**Oblique fissure: (both lungs):**

starts at **T3** posteriorly and extends obliquely downward and forward along the course of **6th rib** till MAL and it ends at **6th costochondral junction**.

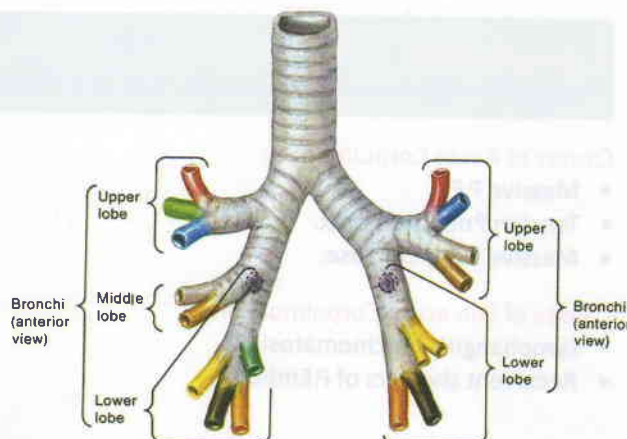
Transverse fissure (Rt lung only):

starts at **Rt 4th costochondral junction** runs laterally and ends at **6th rib at MAL**

Lung Segments: (Bronchopulmonary Segments)

Each lung is divided into a functionally independent segment, each is supplied by a tertiary **bronchus** called **bronchopulmonary segment**. Each one has its own pulmonary artery and vein.

See the picture here and the tables next page ...



Right lung (3 lobes)

Upper (3)	Middle (2)	Lower (5)
• Apical. • Anterior. • Posterior.	• Medial. • Lateral.	• Superior. • Anterior. • Posterior. • Medial. • Lateral.

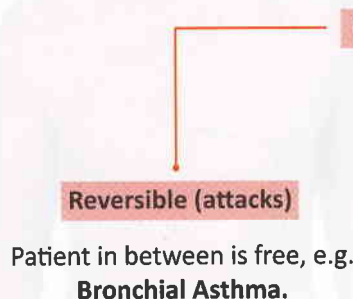
► Chest Cases:**1. Suppurative Lung Syndrome (SLS):**

Group of diseases characterized by cough & expectoration of

- **B**ig amount (profuse).
- **P**urulent.
- **P**ostural.
- **P**aroxysmal.
- $\pm$ Foetid (**b**ad odor).

2. Chronic Obstructive Pulmonary Disease (COPD):

Cough, Expectoration, Dyspnea $\pm$ Wheezes.

**Left lung (2 lobes)**

Upper (4)	Lower (4)
Proper (2 segments) • Apico-posterior. • Apico-anterior. Lingula (2 segments) • Superior. • Inferior.	• Superior. • Antero basal. • Lateral basal. • Post. Basal.

The diseases are

- Lung abscess.
- Bronchiectasis.
- Infected lung cyst.
- Empyema with bronchopleural fistula.

Asthmatic bronchitis	Chronic obstructive bronchitis
Remittent: recurrent on top of wheezy chest.	Progressive: gradually increased.
May be complicated by: Cor pulmonale, complication of chronic cough or respiratory failure.	

Chronic Bronchitis: Productive cough everyday or most of days for 3 successive months in 2 successive years.

Asthmatic bronchitis: chronic bronchitis with evidence of BA as seasonal variation or increased eosinophil or some response to bronchodilators.

3. fibrosis:

Dyspnea (the main symptom) $\pm$ cough

if fibrosis is 2ry to TB, toxic manifestations, chest troubles and history of multiple drugs for prolonged duration can diagnose TB.

4. Pleural Effusion:

- Pleuritic Pain (stitching then dullaching).
- Dry cough and Dyspnea
- History of aspiration (Amount, color, aspect, complications)

► Cor pulmonale:

Right ventricular hypertrophy and / or failure due to chest disease, on top of healthy left side.

Causes of Acute Cor pulmonale:

- Massive P.E.
- Tension Pneumothorax.
- Massive Lung Collapse.

Causes of Sub acute Cor pulmonale:

- Lymphangitis Carcinomatosis.
- Recurrent showers of P.Emboli.

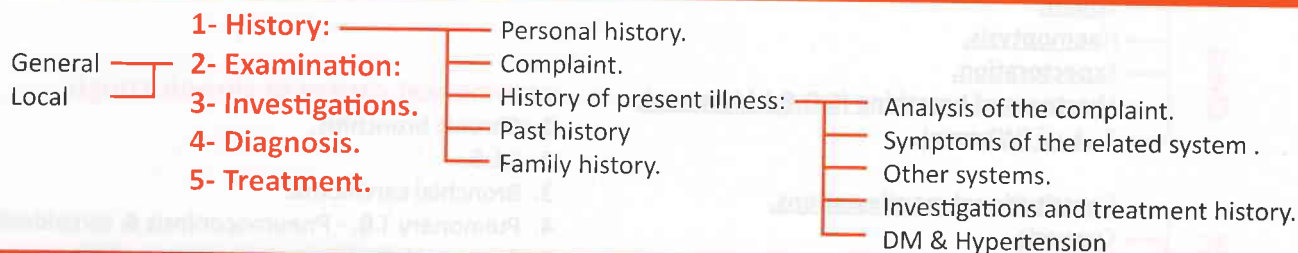
3. Causes of Chronic Cor pulmonale:

Hypoxic: occurs in almost cases of chronic lung disease : COPD & IPF.

Vascular:

1ry Hypertension & pulmonary Bilharziasis.

CHEST SHEET



CHEST HISTORY

► Personal History:

- Name:** اسم حضرتك ايه؟
to be familiar with the patient.
- Age:** عندك كام سنة؟
As certain diseases are more common in certain ages, e.g.
 - T.B. more common in children and **young adults**.
 - Corpulmonale and bronchogenic carcinoma** more common in **old age**.
- Sex:**
Bronchogenic carcinoma more common in **male**.
Adenocarcinoma in **female**.
- Occupation:** بتشتغل ايه؟
persons in certain occupations are more susceptible to certain diseases e.g.
 - Asbestosis: IPF – bronchogenic carcinoma or mesothelioma.**
 - Farmers: bilharziasis – farmer's lung.**
- Marital state:** متزوج؟ عندك اولاد؟ كام؟ اصغرهم عنده كام سنة؟
for possible sterility or impotence.
Infertility in **Immotile cilia Syndrome** or **cystic fibrosis (absent vas deference)**
- Residence:** ساكن فين؟
may reflect socioeconomic condition and may occasionally point to certain disease e.g.
Helwan: interstitial pulmonary fibrosis.
- Special habits:**
بتدخن؟ كام سيجارة في اليوم؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
بتشرب خمر أو مخدرات؟ بطريقة منتظمة ولا في المناسبات؟ نوع الخمر ايه؟
e.g. chronic bronchitis, emphysema (COPD) -
bronchial asthma - cancer lip and tongue - post operative pneumonia.

► Complaint:

On patient's own words + duration ايه اللي تاعبك؟ ايه اللي جابك المستشفى؟ بقاله اد ايه التعب؟
(take the most recent and most important complaint and it should be brief)
Example: the patient is complaining of shortening of breathing of 1 week duration.

► History of present illness (H.P.I.):

- Analysis of complaint.
- Symptoms of the related system.
- Systemic Review:.
- Investigation & treatment (related diseases).
- DM & Hypertention

HPI should be:

- As long as possible and Contains medical terms.
- In chronological arrangement.
- In the form of a story.

1- Analysis Of The Complaint:

For analysis of any complaint in chest as usual (8) + 3 variants + 3 for any excreta.

8 as usual:

- Onset - course - duration. الشكوى ظهرت فجأة ولا بعد أد ايه؟ الأعراض ظهرت بالتدريج ولا على مدى أسابيع أو شهور؟ أو بتحدث في نوبات؟
- Association. هل كانت مصحوبة بحاجة وتذكر الأعراض الثانية التي ممكن تكون موجودة؟
- What increase and what decrease. ايه اللي بيزود العرض ده؟ وإيه اللي بيقلله؟
- Effect of treatment. تأثير العلاج عليه؟؟؟ هل لما بتأخذ العلاج الأعراض بتقل ولا بتفضل زي ما هي؟
- Date of last attack. أخر مرة جالك العرض "وتقول إسم العرض ده" كان إمتى؟

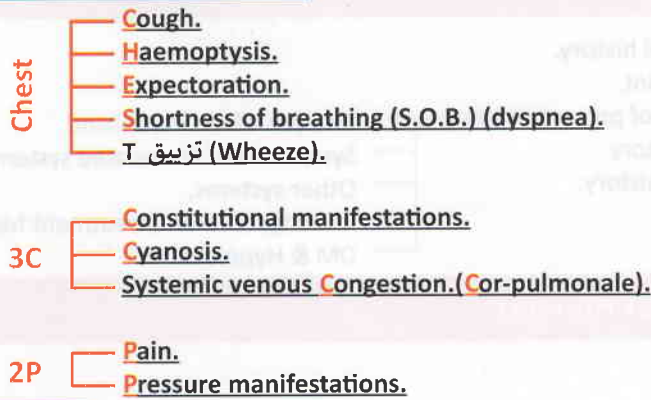
+ 3 variants

- Postural. عندك بلغم بيزيد في وضع معين؟
- Diurnal. العرض ده بيزيد في النهار ولا بليل؟
- Seasonal. بيزيد أو بيقل صيف ولا شتاء؟ ربيع ولا خريف؟

+ 3 for any excreta:

- Amount.
- Content - Color - Consistency.
- Odour.

2- Symptoms of the chest: (chest + 3 Cs + 2 Ps)



commonest causes of chronic cough:

1. Chronic bronchitis.
2. S.L.S.
3. Bronchial carcinoma.
4. Pulmonary T.B. - Pneumoconiosis & sarcoidosis.
5. Post-nasal discharge as chronic sinusitis.

1. Cough:

Defintion: explosive expiration for clearing of tracheo-bronchial tree. " Mainly in COPD & SLS "

Analysis: As before but never forget:

- **Association:**
 - **Wheeze:** B.A.
 - **Hoarseness:** laryngitis.
 - **Vomiting:** pharyngitis.
- **Diurnal Variation:**
 - **Nocturnal:** cardiac.
 - **Early morning:** bronchiectasis & B.A.
 - **All over the day:** chest infection.
 - **Seasonal variation:** allergy.

+ character of cough:

- **Brassy:** tracheal causes (metallic sound form mediastinal syndrome).
- **Bovine:** left recurrent laryngeal nerve paralysis (hollow).
- **Barking:** hysterical.
- **Parexysmal:** whooping cough - cavity syndrome - B.A. + pharyngeal, laryngeal and auditory irritation.

Aetiology: (Reflex - Central - hysterical)

I- Reflex cough: Due to irritation of vagal receptors)

A- Respiratory causes

Causes	Features
1. Pharyngeal diseases: Pharyngitis, tonsillitis, ulcers, Tumors, post-nasal discharge.	Painful, non-productive ± nausea & vomiting
2. Laryngeal diseases: Foreign body, laryngitis, ulcers, tumors	Paroxysmal, painful, barking ± hoarseness of voice or stridor.
3. Trachea- bronchial diseases : Bronchiectasis , Bronchial asthma , Bronchial tumours , Pressure as mediaslinal syndrome	According to the cause+expectoration
4. Parenchymatous lung diseases: • Pneumonias, abscess, T.B. • Collapse, fibrosis, interstitial lung dis • Pulmonary infarction	
5. Pleural diseases: Pleurisy, effusion, pneumothorax, hydropneumothorax & pleural fibrosis.	Usually dry cough due to irritation exaggerated by activity and body movement

Some types of expectoration (See later)

B- Extra-respiratory causes:**Cardiovascular diseases:**

- Pulmonary congestion e.g. left ventricular failure & MS
- Pulmonary embolism
- Pressure: aortic aneurysm, massive pericardial effusion or huge left atrium.

Mediastinal diseases: Aortic aneurysm, tumour, L.N. retrosternal goiter

- Brassy:- tracheal causes (metallic form = mediastinal synd.)
- Bovine:- Lt. RLN paralysis (hollow).

Other causes:

- Abdominal causes: e.g. subphrenic abscess
- Meningeal causes: e.g. meningitis & subarachnoid haemorrhage.
- Aural causes: e.g. otitis medial or extema.

II- Central cough: Due to irritation of cough center.**Causes:** Brain tumours, cerebrovascular strokes, encephalitis.**Features:** Dry cough and neurological manifestations.**III- Hysterical (Psychogenic) cough:**

Usually in young females. Dry & barking cough occurring in front of audience

2. Haemoptysis:**Definition:** coughing of blood. "Mainly in S.L.S. (50% of bronchiectasis)."**Classification:** Differentiated by investigations (laryngoscopy).

- True: below the vocal cord. see next table
- False: above the vocal cord.

True haemoptysis

Type	Causes
Frothy blood tinged	A.P.O. "Acute pulmonary edema"
Blood stained	Acute infection - bronchogenic carcinoma.
Blood streaked	Chronic bronchitis - bronchogenic carcinoma - T.B.
Red current jelly (blood + sputum + hg. debris).	Bronchogenic carcinoma. Klebsilla Pneumonia
Rusty (golden brown)	Lobar pneumonia.
Frank	T.B. - pulmonary embolism - M.S. - B - bronchiectasis sicca haemorrhagica.

DD:

	Haemoptysis	Haematemesis
Preceded by	Cough	Nausea & vomiting
During		
• Contents	Froth	Food
• Color	Bright red	Dark
• PH	Alkaline.	Acidic
Followed by	Blood tinged sputum	Melena.

Analysis:

As before but never forget:

- Effect of treatment: History of **blood transfusion**, indicates severe haemoptysis

Cause of Death in haemoptysis is **asphyxia**, so endotracheal tube is mandatory.

Causes of Haematemesis with Fresh Blood :

- Achlorohydria.
- Massive Bleeding.

T.B is the most serious cause of haemoptysis as it may be followed by fatal haemoptysis.

Causes of haemoptysis

1. Larynx: e.g. laryngitis, foreign body, tumors, ulcers.

2. Tracheobronchial:

- Bronchogenic carcinoma
- Bronchiectasis
- Acute & chronic bronchitis.
- Inhaled foreign body.

3. Pulmonary:

- Infections :- Pulmonary tuberculosis.
- Lung abscess
- Pneumonia
- Aspergilloma
- Massive pulmonary embolism
- Trauma
- Vasculitis e.g. Wegener's granulomatosis.
- Goodpasture's syndrome
- Pulmonary haemosiderosis
- Pulmonary A-V malformation

4. Cardiovascular causes:

- Pulmonary congestion: due to left-sided heart failure.
- Pulmonary oedema
- Severe hypertension.

5. Systemic causes:

- Haemorrhagic blood diseases as purpura & haemophilia

► N.B.

Bronchiectosis Sicca Haemorrhagica:

Special type of bronchiectasis caused by TB characterized by frank haemoptysis.

Explained as; TB usually affects the apical part of the lung, with good drainage so, presented with Dry cough and Frank haemoptysis.

3. Expectoration:

Definition: excessive spitting. " Mainly in COPD - SLS "

Analysis: As before but never forget:

- **Postura Variation:** e.g. Postural variation can diagnose hardly the anatomical site of the lesion.
 - **Postural variation: with S.L.S.**
 - **Unilateral: increased on healthy side in lung abscess.**
 - **Bilateral: increased with leaning forward in bronchiectasis.**

+ 3 for any excreta:

- Amount, > 250 cc = 1 cup
- Content - Color - Consistency.
- Odour; very bad odour in anaerobic or fungal infection

Expectoration in COPD and S.L.S.:

	S.L.S.	COPD
Type	Purulent.	Mucoid or muco-purulent
Postural	Positive.	No
Association	Toxemia.	Dyspnea - wheeze

► N.B.

Excessive eosinophils can cause sputum to appear purulent like (yellow).

► N.B.

Anti biotic is indicated in COPD only if sputum become yellowish in color.

Different types of expectoration:

1. Frothy (serous)	- Pulmonary oedema (pink frothy sputum). - Pulmonary venous congestion. - Broncho alveolar carcinoma.
2. Muroid	- Chronic bronchitis. - Bronchial asthma.
3. Purulent Mucopurulent	- abscess and bronchiectasis. - any form of broncho pulmonary infection.
4. Rusty Golden brown	Pneumonia. (altered blood pigment)
5. Chocolate	Amebic lung abscess (Anchovy Sauce).
6. Red-current jelly	- Klebsilla Pneumonia - Bronchogenic carcinoma.
7. Caseous	TB; nummular sputum (coin like).
8. Black	Inhalation of carbon.

Red Current Jelly Sputum

**4. Dyspnea: C/O = SOB**

May be Obstructive (COPD) or Restrictive (fibrosis).

Analysis: 8 as usual + 3 variants + in C.V.S.

► N.B.**Causes of paroxysmal dyspnea:**

A = Asthma (bronchial / cardiac / uraemic)

H = Hysterical.

L = Laryngismus stridulus.

A = Allergic alveolitis.

M = Myasthenia gravis / mediastinal syndrome.

cardiac dyspnea usually exertional associated with cardiac symptoms (PND or orthopnea).

► N.B.**Causes of Exertional Dyspnea:****1. Hypoventilation:**

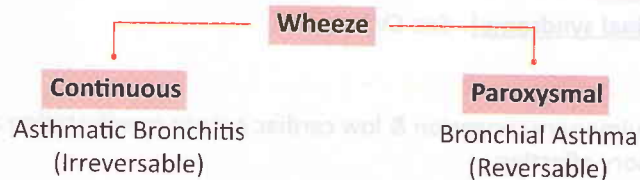
obstruction (COPD) or restriction (fibrosis).

2. Hypodiffusion:

fibrosis or congestion (left sided failure).

Causes of acute dyspnea:**1. Hypoventilation:**

obstruction (foreign body or 1st attack of br. asthma) or restriction (pneumothorax).

2. Hypodiffusion: cardiac asthma (APO).**3. Hypoperfusion:** pulmonary embolism.**5. Wheeze: Analysis: 8 as usual + 3 variants****6. Constitutional manifestations (toxic):**

- Anorexia.
- Loss of weight.
- Fever.
- Sweating.

in S.L.S. & T.B.

7. Cyanosis: Ask about cyanosis in patient own words

8. Systemic venous congestion:

Stress on **jaundice** and **lower limb edema**.

► Jaundice in chest case:

- **Hepatocellular:** in cor-pulmonale (liver congestion).
- **Haemolytic:** in pulmonary infarction.
- **Obstructive:** in bronchial carcinoma (liver metastasis).

► LL oedema in chest case:

- **R.V.F.:** corpulmonale.
- **Hypo-albuminemia:** Excessive expectoration for a long time, or Frequent aspiration of empyema.
- **Nephrotic syndrome:** due to renal amyloidosis in chronic S.L.S.
- **Acid-base disturbance** in COPD
increased CO₂ >> Resp. Acidosis >> Compensatory Met. Alkalosis (↑ Hco₃ retention)
- **Hypoxia and Toxins** >> increase capillary Permeability

9. Chest Pain:

Analysis: 8 as usual + 3 variants

Chest pain of pulmonary origin:

Non central	Central (Retro sternal)
• Skin: H.Z. • Muscle: Ms Strain & Myositis • Ribs: Fracture or Osteomyelitis • Pleura: • Plurisy (Stitching) • Plural Effusion (Dull Aching) • Embyema (Throbbing) • Pneumothorax (Tearing)	• Acute mediastinitis. • Mediastinal tumors. • Tracheitis. • Mediastinal emphysema.

► Specific for pleural diseases:

- Characterized by: Stitching.
- Increased with breathing, cough and straining.
- Relieved by lying on the diseased side.
- Localized except diaphragmatic pleurisy

► N.B.

- Lung Diseases as Pneumonia, Pulmonary infarction, lung abscess or bronchogenic carcinoma may cause pain due to pleurisy

10. Pressure manifestations:

Mass in the chest (**mediastinal syndrome**). See CVS

3. Other Systems:

CVS: Systemic congestion, pulmonary congestion & low cardiac output manifestation as syncope

Neurology: motor and sensory affection

if nothing involved write

eg. no symptoms suggest other systems affection

4. Investigation & treatment (related diseases):

eg. patient investigated by ECG, chest X-ray, ECHO cardiography and treated by Beta blocker

5- DM and Hypertension:

DM and HTN are usually considered as past history, but they better be considered as present history as they are highly important and never cured (controlled not cured).

- Diabetes Mellitus: عندك سكر؟ من إمتى؟ أخذت علاج إيه؟ جرعتيه أد إيه؟ آخر تحليل سكر كان كام؟ حصل أي مضاعفات؟
- Hypertension: عندك ضغط؟ من إمتى؟ أخذت علاج إيه؟ جرعتيه أد إيه؟ آخر مرة قيست الضغط كان كام؟ حصل

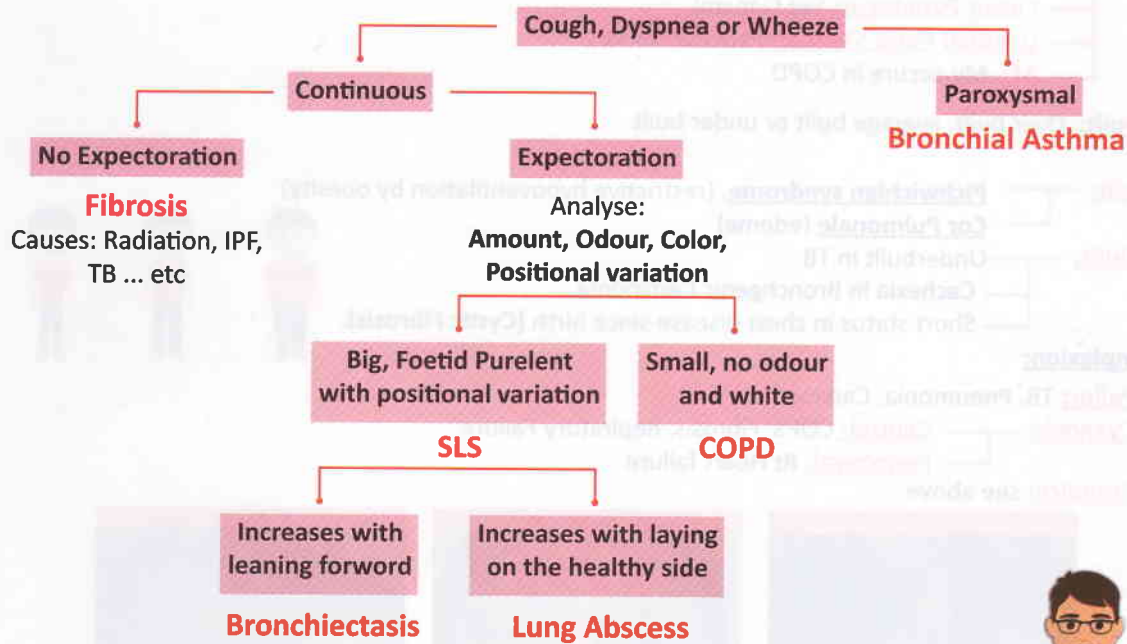
► Past History:

- T.B.
- D.M. (T.B. follows D.M. as its shadow).
- Similar attack.
- Asthma.
- Bilharziasis.
- Chest trauma.
- History of anaesthesia or coma (aspiration).

► Family History:

- History of chest infection e.g. T.B.
- Similar conditions.
- History of allergy (asthma).
- History of D.M. (T.B. follows D.M. as its shadow).

Diagnostic Algorithm for chest symptoms and diseases:



Summary of History:

Cough

فيه كحة ؟؟؟ ظهرت فجأة ؟؟ ولا إزاي ؟؟؟
كانت مصحوبة بحاجة ؟؟؟؟
إيه اللي بيؤدها ؟؟؟ وإيه اللي بيقلها ؟؟؟
بتزيد في وقت معين ؟؟؟ بتزيد قليل ولا ثابتة ؟؟؟

Haemoptysis

بتكح دم ؟؟؟
من إمتى ؟؟ وظهرت فجأة ولا بالتدريج ؟؟؟
كانت مصحوبة بحاجة ؟؟؟
الكمية أد إيه ؟؟ لونه إيه ؟؟؟ الرائحة ؟؟؟

Expectoration

عندك بلغم زيادة ؟؟؟
بيزيد في وضع معين لما بتميل لأدام مثلاً ؟؟؟ ولا بيزيد لما بتنام على جنبك ؟؟؟
بيزيد في موسم معين أكثر من الثاني ؟؟ بيزيد في الصيف عن الشتاء ؟؟؟
الكمية أد إيه ؟؟؟ لونه إيه البلغم ؟؟ والرائحة ؟؟

Dyspnea (Shortening of breathing)

عندك كرشة نفس ؟؟؟

Wheeze (تزييق)

عندك تزييق في صدرك ؟؟؟

Constitutional symptoms

عندك فقدان للشهية ؟؟؟ وزنك خس ؟؟؟ بتعرق كثير ؟؟؟

Systemic Congestion

رجلك أو بطنك تفسح ؟؟؟
فيه ألم في جنبك اليمين ؟؟؟

Cyanosis

إزرقيت ؟؟؟ حصل زرقعة ؟؟؟

Chest pain

عندك ألم في صدرك ؟؟؟

Pressure manifestations

هل صوتك اتنبح ؟؟؟
هل عندك صعوبة في البلع ؟؟؟

Other Systems

هل عندك مشاكل في أي جزء ثاني في جسمك ؟؟؟
عملت فحوصات إيه ؟؟
وأخذت علاج إيه ؟؟؟

GENERAL EXAMINATION

A أرقام **Vitals: Blood pressure, pulse, Respiratory rate, Temperature.**

Fever: **Low grade:** TB & Carcinoma
High grade: Pneumonia & Abscess

BP: **Hyper tension:** Vasculitis, BA treated with steroids
Hypotension: CorPulmonale (↓COP) & Addison's Disease caused by TB.

Pulse: **Big volume:** due to Hypoxia.
Small volume: Cor Pulmonale
Pulsus Paradoxus: See General.
Unequal Pulse Volume: Pancost Tumor
AF: My occur in COPD

B **Built:** Over built, average built or under built

Over Built: **Pichwichian syndrome.** (restrictive hypoventilation by obesity)
Cor Pulmonale (edema)

Under Built: Underbuilt in TB.
 Cachexia in Bronchogenic Carcinoma.
 Short status in chest disease since birth (**Cystic Fibrosis**).

**C** **Complexion:**

Pallor: TB, Pneumonia, Carcinoma.

Cyanosis: **Central:** COPs, Fibrosis, Respiratory Failure
Peripheral: Rt Heart failure

Jaundice: see above

**D** **Decubitus or position**

- **Lateral Decubitus:** in unilateral chest disease.
- **Orthopnea** in Emphysema
- **Platypnea** in apical lung lesion or tumor
- **leaning forward or praying position** in Pleural effusion, Mediastinal syndrome.

- Cor-pulmonale.
- Massive pleural effusion or pneumothorax.
- Chronic obstructive pulmonary disease.
- Mediastinal syndrome.

E **(H & N): Congested neck vein**

upper limb

lower limb: Lower limb edema

- **Tremors**
 - **Flapping:** in respiratory failure (CO₂ retention)
 - **Fine:** Beta stimulation as in bronchodilators

Clubbing

- **Blue**
 - IPF.
 - COPD (mild & usually if associated with Br.carcinoma or Bronchiectasis)
- **Pale**
 - SLS
 - Bronchogenic Carcinoma
 - Mesothelioma

F فكر **Mentality:** Disturbed mentality (CO₂ narcosis).

Face + general look.

Puffiness (chronic cough).

► **Enlarged lymph nodes due to:**

- Bronchogenic carcinoma (Scalene lymph nodes).
- Tuberculosis
- Sarcoidosis.

Value of Other System examination**► CVS examination**

Cause	Result	Association
• Pulmonary congestion. • Pleural effusion. • Left sided failure (BBC).	• Cor-pulmonale.	• Kartagner's syndrome.

► Abdominal examination

Liver (hepatomegaly)	Spleen (splenomegaly)	Ascites
• Cor-pulmonale. • Ptosed liver (emphysema). • Amoebic liver abscess. • 2ry from Br. Carcinoma. • Fatty changes (toxemia). • Association.	• Cor-pulmonale. • Miliary T.B. • Sarcoidosis. • Amyloidosis. • Associated.	• Cor-pulmonale. • T.B. peritonitis

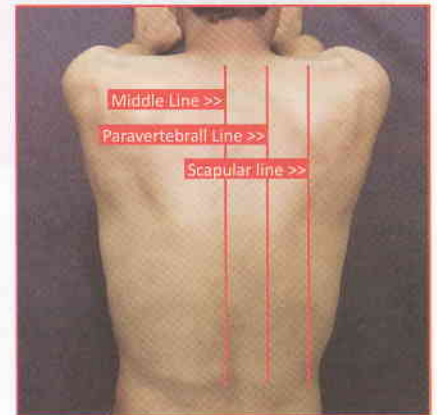
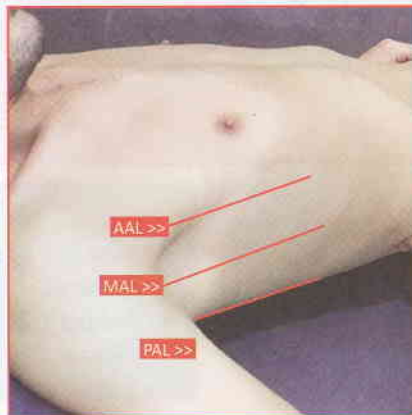
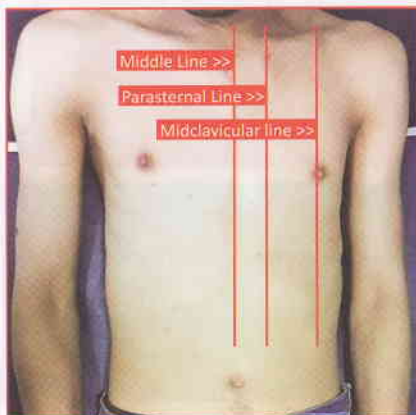
► N.B.

- Ascites + Rt pleural effusion = suggestive to **liver cirrhosis**.
- Ascites + left pleural effusion = suggestive to **lung disease** e.g. T.B.

INTRODUCTION TO LOCAL CHEST EXAMINATION

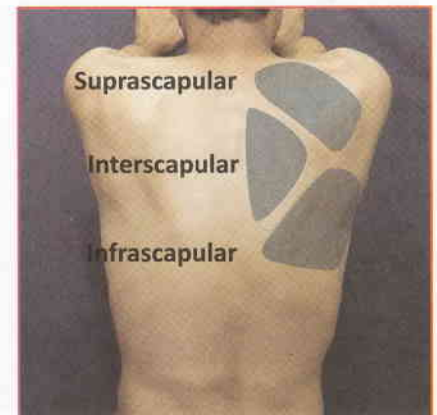
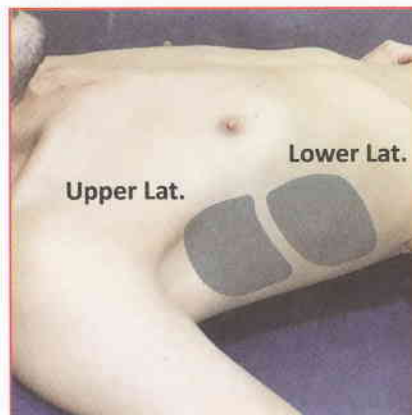
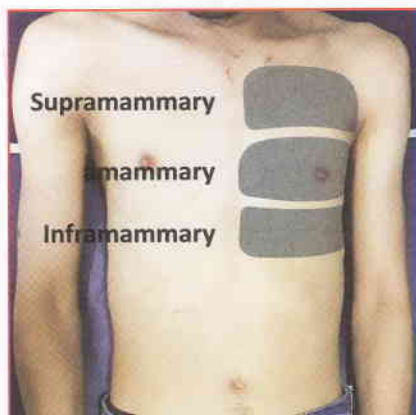
Lines of the chest:

Front	Lateral	Back
Mid line: middle of the sternum	AAL: anterior fold of axilla.	Midline: spines of the vertebrae.
Parasternal: midway between MCL and lateral border of the sternum.	MAL: apex of axilla.	Paravertebral: midway between midline and medial aspect of the scapula.
MCL: midway between the acromion process and sternoclavicular joint (as Mid way of inguinal line).	PAL: posterior fold of axilla.	Scapular line: from the angle of the scapula.



Areas of the chest:

Front (3)	Lateral (2)	Back (3)
• Supra-mammary. • Mammary. • Infra mammary.	• Upper lateral. • Lower lateral.	• Supra scapular. • Inter scapular. • Infra scapular.



LOCAL CHEST EXAMINATION

Inspection (6) (SMS TP +)	Palpation (5) (T)	Percussion (4)	Auscultation (3)
1. Shape of the chest.	1. Trachea.	1. Lung proper.	1. Breath sound.
2. Respiratory Movement.	2. Tenderness.	2. Bare area.	2. Adventitious sounds.
3. Skin lesion.	3. T.V.F.	3. Traub's area.	3. Vocal Resonance.
4. Trachea (Trill's sign)	4. Palpable wheeze. تزييق	4. Kronig's isthmus.	
5. Pulsations.	5. Expansion تمدد		
6. Litten's sign.			

► Inspection:

1. Shape of Chest:

Normal Chest Shape:

- Elliptical in shape
- Diameters: Transverse: Anteropost. = 7:5
- Symmetrical
- Subcostal angle: ≤ 90
- Ribs: Oblique
- Spaces: Narrow



Inspecting the chest looking for: Shape, Movement, Pulsations and skin (Better to stand at the patient feet to get a better tangential View)



► Abnormal Shapes:

1. Barrel shaped chest: "Emphysematous"

as in COPD

- Antero posterior $\geq$ transverse.
- فوق Thick shoulder.
- تحت Sub-costal angle: wide.
- امام Protrusion of the sternum.
- خلف Kyphosis.
- Ribs: transverse with wide I.C. spaces.

► N.B.

Short cricosternal distance $< 5\text{cm}$ (3 fingers) is the surest sign for barrel shaped chest

2. Funnel chest: "Pectus excavatum"

Congenital or occupational.

3. Pigeon chest: "Pectus carniatum"

Congenital or Rickets.

4. Unilateral retraction:

Fibrosis & collapse.

5. Unilateral bulge:

- **Pleura:** effusion, pneumo-thorax.
- **Chest wall:** emphysema, tumors.

► N.B.

To differentiate between retraction and bulging look at the moving side which is the **healthy one**.

Barrel shaped chest



Pectus Excavatum



Pectus Carniatum



2. Respiratory Movement:

Rate: (12 - 20 cycles per min.) (pulse / Res. = 4 / 1).

Abnormal rate:

Tachypnea as in Acute Dyspnea or Fever.

(↑ 20)

Bradypnea due to suppression of RC by

(↓ 12)

↑ ICT

Morphine

Alcohol

Rhythm: Regular (Normal Rhythm) or irregular

Irregular Respiratory rhythms:

• **Chyene Stokes Breathing:**

Gradual decrease in the depth of respiration till apnea for a period then gradual increase in the depth of respiration till a peak and so on

Occurs in:

- Elderly (During sleep)
- increased ICT
- Depressed RC

• **Biot's (Ataxic) Rhythm:**

Irregular breathing in rate and depth with periods of apnea

Occurs in:

- Meningeal Irritation
- Subarchenoid Hge

Depth: average, deep or shallow.

Type:

Normally inspiration is produced by contraction of diaphragm & intercostal muscles, while expiration is an passive process produced by the recoiling action of the elastic lung tissue.

- In **male:** Respiration is mainly abdomino-thoracic.
- In **female** it's mainly thoraco-abdominal.

Abdonrmal respiration:

- **Abdominal:**
 - Intercostal muscle paralysis
 - Limitation of chest expansion (Ankylosing)
- **Thoracic:**
 - Diaphragmatic paralysis
 - Abdominal destention

Degree of chest expansion:

Normally: Chest moves freely with respiration. chest expansion is detected accuratlly by a tape meter.

Limitation in chest movement:

- **Unilateral:** Fibrosis, collapse on the affected side
- **Bilateral:** Emphysema, Bronchiectasis (Bilateral diseases)

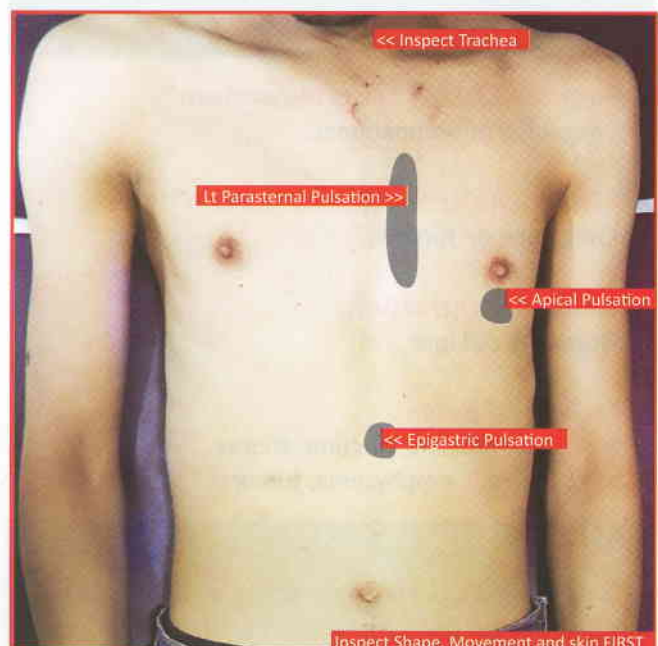
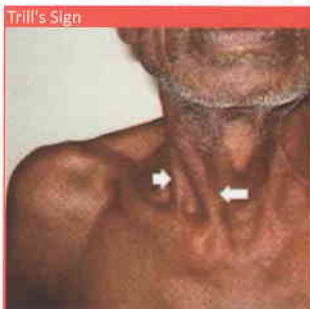
3. Skin Lesion:

Scars, dilated veins & pigmentations.. etc.

4. Trachea (Trill's Sign):

Trill's sign

Prominent sternomastoid tendon on the shifted side



5. Pulsations:

Apex: absent in emphysema.

Epigastric & left parasternal pulsations (RV ++).

6. Litten's Sign:

Shadow (effect) of diaphragmatic descent which normally appear on chest wall during inspiration.

Its presence exclude:

- Paralysis of diaphragm.
- Pleural effusion.

Its absence may be :

- Diaphragmatic paralysis.
- Pleural effusion.
- Normal but in Obese.

Exaggerated:

with Resp. Distress

► **N.B.****Hoover's sign:**

It refers to inward movement of the lower rib cage during inspiration in Respiratory Distress.

► **N.B.****Signs of Respiratory Distress: (On Request).**

1. Exaggerated litten's sign
2. Hoover's sign
3. Tracheal tug with inspiration
4. Working Ala Nasi
5. Abdominal movement of accessory muscles
6. **Tripod position:**
one sits or stands leaning forward and supporting the upper body with hands on the knees or on another surface, so he can use latismus dorsi in approximating ribs.
7. Pursing lips : To ↑ intrabronchial pressure and prevent collapse of alveoli
8. tachpynea
9. Tachcardia
10. Cyanosis

► **N.B.**

Respiratory Failure is a Lab
Diagnosis depends on ABG.

► **Palpation:****1. Trachea:**

Trachea is **clinically central**, but **radiologically shifted to the right** because of aortic arch.

Technique of palpation:

- Put the patient in the sitting position.
- Fix his head by your left hand.
- Insert your index in the pouch between the two sternal ends of sternomastoid.

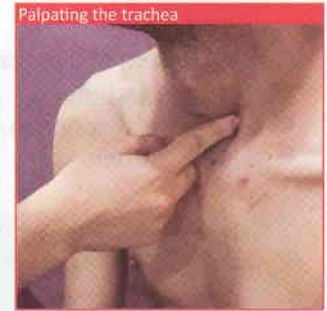
Cricosternal Distance = 3 finger breadth from the patient's fingers (**roughly ≥ 5 Cm**).

- if shorter than that means Barrel shaped Chest.



Causes of tracheal shift:

To the same side of lesion	To the opposite side of lesion
• Fibrosis • collapse • pneumonectomy.	• Pleural effusion • pneumothorax • hydro-pneumothorax • unilateral emphysema.

**► Tracheal tug:**

1. Campbell's sign = tracheal tug with inspiration: Trachea descent with inspiration in severe COPD (It is not specific).

Explained by pulling on the trachea during inspiration due to strong diaphragmatic contraction in COPD.

2. Oliver's sign = tracheal tug with pulsation: descent of cricoid cartilage with ventricular contraction in cases of aortic aneurysm.

2. Tenderness: according to the site

Over sternum	Over spaces	Over ribs	Right side
Leukemia.	Empyema.	Fracture or osteomyelitis.	Amoebic liver abscess.

3. TVF:

Definition: vibration of the vocal cords transmitted through airway & chest wall to be palpated on the chest wall.

Technique:

- Ask the patient to say 99 (44 in Arabic)
- Palpate the chest area by area

4. Palpable Wheeze:**Technique:**

- With deep respiration.
- Palpate the chest area by area

Causes in COPD.

5. Expansion:**Technique:****Front:**

Supramammary: Put your hand on both sides close to each others and ask your patient for deep respiration & observe movement.

Mammary and Inframammary: take a skin pinch by your hand and ask the patient to inhale.

Back: supra-scapular (Put you hands and observe elevation of them with respiration & infra scapular areas (pinching).

Normally Chest expands about 5 - 7 cm

Causes of limitation of chest expansion:

- Bilateral: COPD & bronchiectasis.
- Unilateral: fibrosis & collapse.

► N.B.**Causes of increased T.V.S.: 3 Cs**

- **C**onsolidation.
- **C**ollapse Or fibrosis with a patent bronchus.
- **C**avity if superficial & surrounded by consolidation.

T.V.F. is reduced in any other chest diseases.

Physiologically higher in the 2nd right space, As the right bronchus is more superficial.

TVF can't be done with:

- Hoarsness of voice.
- Vocal Cord Paralysis.

► N.B.

Palpable Rub Detected in: Pleurisy

Palpable Crepitations Detected in:

Coarse cerpitations

► N.B.**Examine Mediastinum: means**

- Trachea
- Inspection → Trills
- Palpation
- Heart → Apex.

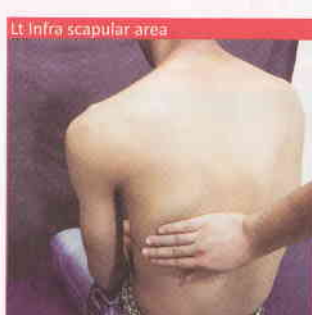
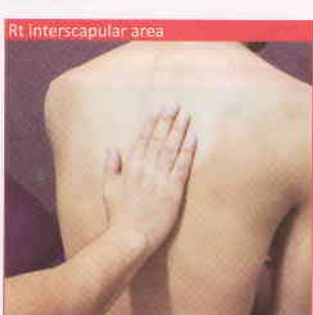
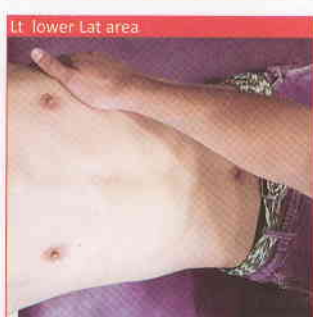
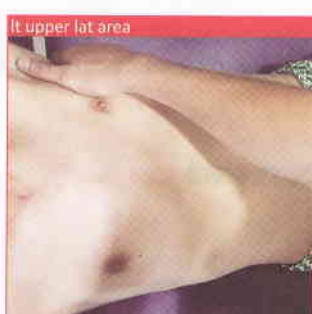
► N.B.

Start by **palpable wheeze and tenderness** at the same time by asking the patient to take a breath while papat-ing chest areas area by area with comparision (rt and lt) also look at the patient face to observe tenderness.

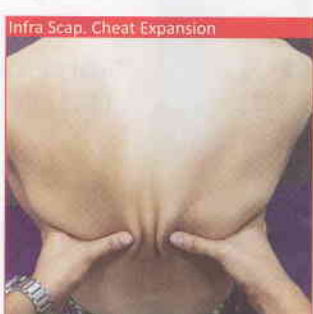
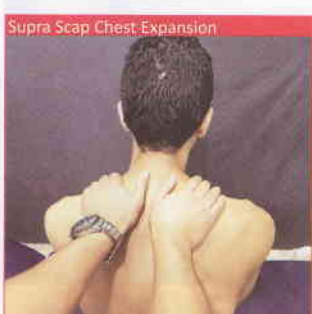
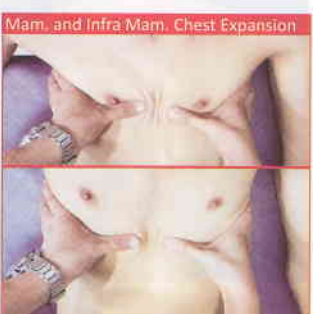
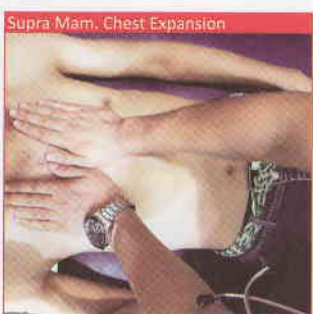
Then TVF by asking the patient to say 44 in arabic or 99 in english while palpating chest areas area by area with comparison (rt and lt)

Then Chest expansion

► Chest Palpation area by area with Rt and Lt comparison
(searching for tenderness, palpable wheezes and TVF):



► Palpating chest expansion:



► **Percussion:****Principle and technique:** (air is resonant, everything else is dull)

We use the middle finger of the right hand, it struck sharply and quickly with the tip over the shaft of the middle phalanx of the left middle finger.

Place the left hand on the chest wall with the fingers parallel to the ribs, the middle finger is placed firmly in the inter-costal space chosen.

Light percussion gives palpable rather than audible vibration.

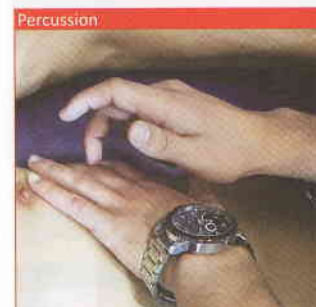
Heavy percussion gives palpable and audible vibration.

Types of percussion notes:

1. **Tympanic:** hollow e.g. normal trauß's area.
2. **Hyper-resonance:** emphysema and pneumothorax.
3. **Resonance:** normal lung.
4. **Impaired note:** pulmonary consolidation or fibrosis.
5. **Dullness:** pulmonary consolidation, pulmonary collapse & fibrosis.
6. **Stony:** pleural effusion.

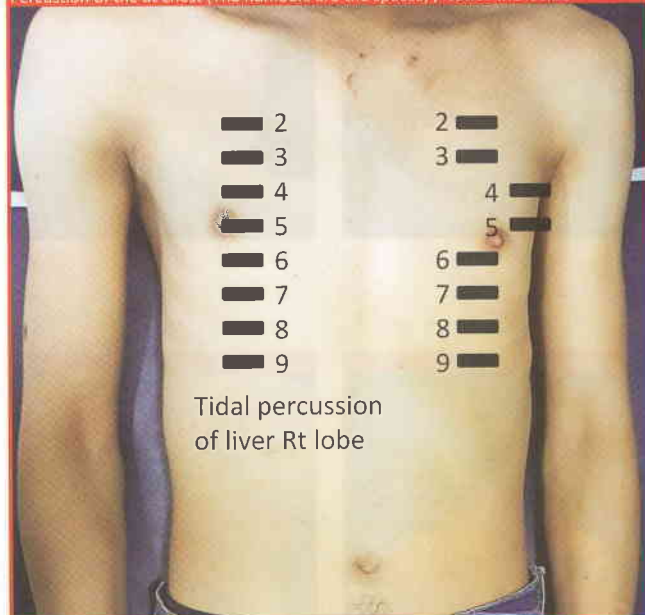
Methods:

- **Hepatic Dullness (Tidal Percussion)**
- **Heart Percussion**
- **Chest Percussion:**
 - Lung Proper
 - Special Areas

**1. Lung Proper:**

Front	Lateral	Back
1. Clavicular (direct). 2. Infra clavicular. 3. Space with space at MCL except left 4th & 5th spaces at AAL. 4. Ends at the Rt. Side by hepatic dullness (tidal P.) ends at the Lt. side by tympanitic resonance of trauß's area.	At MAL space by space.	Started by Kronig's isthmus. Then, • Supra scapular. • Inter scapular. • Infra scapular. Alternative, Space by space

Percussion of the chest (The numbers are the spaces), Notice the Lt side



Direct percussion on the rt clavicle



Rt Supra scapular percussion



Rt inter-scapular percussion



Rt Infra scapular percussion



- Percussion of chest from front by **light** percussion
- Percussion of chest from back by **Heavy** percussion

2. Bare Area:

Definition: area of the heart not covered by the lung.

Anatomy: **left 4th & 5th** inter-costal spaces, from the **left border of the sternum** to the left **parasternal line**.

Normally: dullness (blood).

Abnormalities:

- **Resonant of the bare area in:**
 - Emphysema (the surest sign).
 - Pneumothorax.
- **dullness of the bare area in:**
 - Collapse.
 - Rt. V ++.
 - Pericardial effusion.

3. Traub's Area:

Definition: area of the chest overlying the air bubbles at the fundus of the stomach.

Anatomy:

- 5th rib at MCL.
- 9th rib at MAL.
- Costal margin at MAL.
- 8th costochondral junction.

Normally: tympanitic resonant. (air bubbles).

Abnormalities:

- **Dullness:**
 - **Above:** pleural effusion & pericardial effusion.
 - **Down:** ascites, pregnancy and tumors.
 - **Right:** hepatomegaly.
 - **Left:** splenomegaly.
 - Full stomach or gastric tumor.
- **Wide area:**
 - Lobectomy, splenoectomy.
 - Shrunken liver or dilated stomach.

4. Kronig's Isthmus:

Definition: a band of resonance overlying lung apex.

Anatomy:

- **Anterior:** clavicle (medial 2/3).
- **Posterior:** trapezius muscle (medial ½).
- **Medial:** root of the neck.

Bony border:

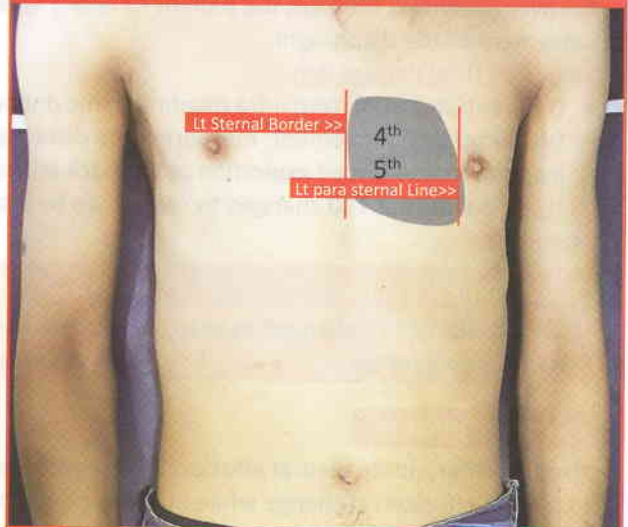
- **Anterior:** medial 2/3 of the clavicle.
- **Posterior:** medial ⅓ of the spine of the scapula.
- **Lateral:** a line connects 2 points:
 - Junction between med 2/3 & lat ⅓ of the clavicle.
 - Junction between med ⅓ & lat 2/3 of scapula spin
- **Medial:** a line connects sternoclavicular joint and C7
- **Normally:** resonant.

Abnormalities: dullness in apical lesions as:

- T.B.
- Pancoast tumor.
- Friedlander's pneumonia.
- Fibrosis / collapse.
- Pleural thickness.

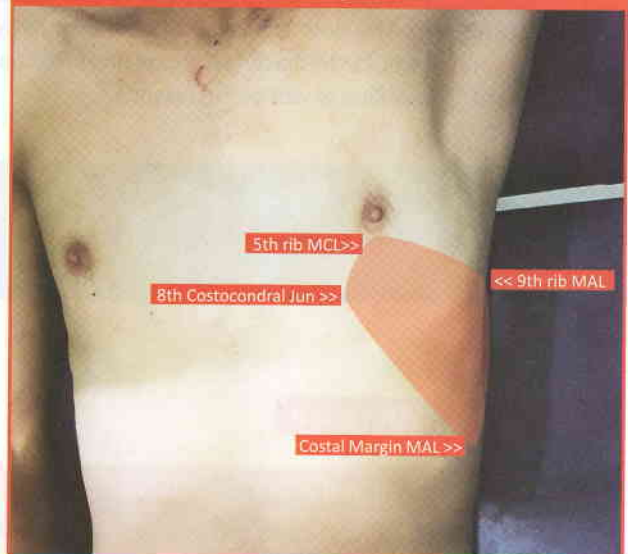
Bare Area Examination Technique: (light percussion)

- Classic: from outwards inwards.
- Alternative from above downwards.



Traub's Area Examination Technique: (light percussion)

From above downwards at AAL. Or, From out inward.



Kronig's Isthmus Examination Technique: (light percussion)

from the back while the patient in sitting position and from in outward.



► **Tidal Percussion:**

Percuss the Right Ant. chest wall at MCL from above at 2nd intercostal space downwards till the upper border of the liver (Dullness) then ask the patient to take a breath, Percuss again → the dullness converts to resonance due to movement of the diaphragm.

Values of Tidal Percussion:

- Differentiate supra from infra diaphragmatic dullness (see the lower table)
- Diaphragmatic movement: measuring the distance between the lower border of pulmonary resonance in full inspiration and forced expiration at the back of the chest.

Normal: dullness at T10 changed to resonance by inspiration

Abnormalities

Infra diaphragmatic	Reversed tidal percussion	Supra diaphragmatic
Dullness above T10 changed to resonance by inspiration.	Resonant becomes dull on inspiration (diaphragmatic paralysis).	Dullness above T10 (didn't change).

► **Shifting dullness:**

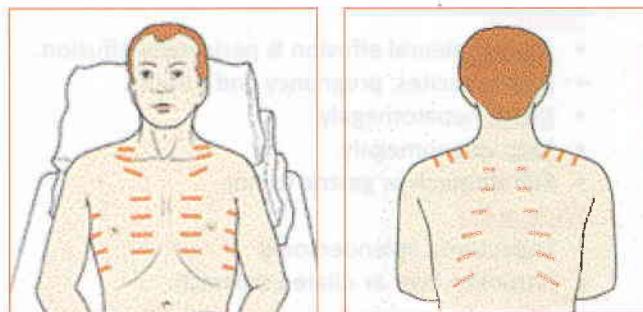
Used to differentiate pleural effusion, from hydro pneumothorax by percussing in 3 planes.

In pleural effusion no change while in hydro pneumothorax it is changed.

- **1st plane:** Percuss the **M.C.L** from above downward till the dullness, proceeds one space above (resonant), ask the patient to sit, the resonance will be dull in hydro pneumothorax).
- **2nd plane:** Percuss from the **sternum to the axillary line** till the dullness, ask the patient to lie on the opposite side. The dullness will be resonance in hydro pneumothorax.
- **3rd plane:** Percuss the **back (scapular line)** from above downward till the dullness, ask the patient to lean forward. The dullness will be resonant.

► **N.B.**

Classical Percussion is in all spaces & in all lines by comparison.

► **Muscles of Respiration**

Normal	Accessory	
• Diaphragm. • Inter-costal muscles. "only for inspiration as expiration is a passive process".	Inspiratory muscles	Expiratory
	• Sternomastoid. • Trapezius. • Scaleni.	• Abdominal muscle. • Latissimus dorsi. • Lips.

Components & Types of Respiratory Failure.

Type 1 : Hypoxia with **normo/hypo**-capnea.

Type 2 : Hypoxia & **Hyper**capnea.

	Normal	Respiratory Failure
PO ₂	80 - 100 mmHg	< 60 mmHg
PCO ₂	35 - 45 mmHg	> 50 mmHg
PH	7.35 - 7.45	↓ in type 2

► **N.B.**

Usage of accessory muscle means difficult breathing in cases of airway obstruction as COPD.

► **Auscultation:**

- We can use either diaphragm or bell (cone).
- Most of the sounds reaching the chest wall from the bronchi and lungs are of low frequency so, **the bell is preferred.**
- Stretching of the skin and hairs under the diaphragm during deep breathing produce sounds like pleural rub or crepitations so **the bell is preferred.**
- The patient is relaxed and breathing deeply and fairly rapidly through the mouth.
- Avoid prolonged deep breathing to avoid giddiness or tetany.
- In each area we comment on and compare the following:

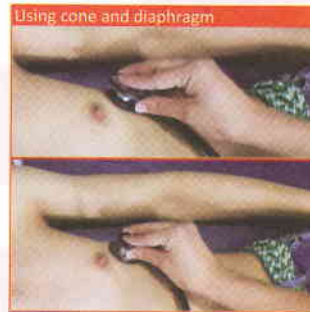
1. Air entry.

2. Breath sounds.

3. Additional sounds.

4. $\pm$ vocal resonance.

Using cone and diaphragm



Lt supra mammary area



Rt supra mammary area



Rt mammary area



Lt mammary area



Lt infra mammary area



Rt infra mammary area



Rt sup lat area



Lt sup lat area



Lt Sup Lat area



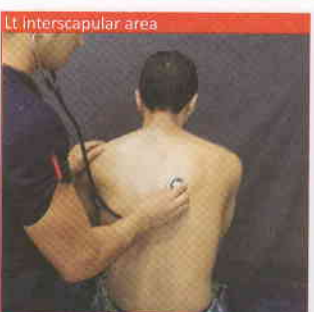
Rt Sup Lat area



Rt supra scapular area



Lt supra scapular area



Lt interscapular area



Rt interscapular area



Rt infra scapular area



Lt infra scapular area

1. Air Entry:

Reduced air entry

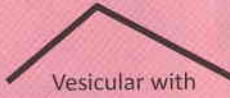
Reduced air flow

- Severe C.O.P.D.
- Collapse.

Reduced conduction

- Pleural disease.
- Thick chest wall.

2. Breath Sounds:

	Vesicular breathing (V.B.) (alveolar breathing) The alveoli are functioning.	Bronchial breathing (B.B.) The alveoli are out of function
Character	Soft. No gap. Inspiration > Exp (3:1)	Hollow. Gap. Insp. ≤ Exp.
Causes	<u>A. In normal persons.</u> <u>B. Vesicular breathing with prolonged expiration (harsh vesicular):</u> Obstructive airway as; COPD. but may be diminished breath sound in severe COPD.	<u>A. Normally on trachea.</u> <u>B. Abnormally in (3 Cs):</u> • Consolidations. • Collapse with patent bronchus. • Cavity if superficial & surrounded by consolidations. <u>Subtypes of B.B. are:</u> tubular, cavernous & amphorous.
	 Normal  Vesicular with prolonged expiration (Harsh)	 Bronchial

to confirm bronchial breathing:

- compare with trachea.
- whispering pectology

Bronchial Breathing

Tubular	Cavernous	Amphoric
High pitched sound	Low pitched sound	Low pitched sound
• Consolidations. • Collapse with patent bronchus. • Cavity if superficial & surrounded by consolidation.	Cavity: • T.B. • Abscess.	Cavity with tense wall • Tension pneumothorax. • Large superficial cavity. • Bronchopleural fistula.

► N.B.

Broncho Vesicular Breathing: Vesicular Inspiration & bronchial expiration occurs in patchy consolidation

Despin's sign: bronchial breathing below the level of trachea "4th thoracic vertebra" due to enlargement of the inter bronchial lymph node.

Causes:

- T.B.
- Carcinoma.

3. Additional Sounds:

Additional Sounds are three:

1. Rhonchi.
2. Crepitations.
3. Rub.

In any additional sounds:

- Distribution.
- Timing.
- Type.
- Effect of cough.



1. Wheezes (Rhonchi)

Definition: it is continuous musical sound.

Causes: bronchiolar or bronchial obstruction by:

- Spasm of the wall.
- Mucous in the lumen.
- Pressure from outside by L.N. enlargement. so the air passes in a narrowed bronchus.
- it occurs in B.A. & C.O.P.D. due to spasm & mucous secretion.

Types of Wheezes

Siblent	Sonorous
high pitched	low pitched
distal small bronchioles	central big bronchioles or bronchi
best heard over sides	best heard over midline
e.g: bronchial asthma.	e.g: chronic bronchitis.

it can be :

- **Generalized:** bronchitis.
- **Localized:** Foreign body , any secretions.

Effect of Cough :

- inspiratory rhonchi changes with cough due to the secretions which present in bronchi.
- Expiratory rhonchi not changed with cough as it is due to spasm or edema of bronchial wall.

► N.B.

Character of rhonchi in COPD:

- Generalized (bilateral).
- Inspiratory & expiratory but mainly expiratory.
- Changed with cough.
- Polyphonic.

► N.B.

- Wheezes may be heard in fibrosis.
- Localized, monophonic, fixed wheeze is specific for tumor.

2. Crepitations (Rales, crackles)

Definition: it is an interrupted moist non musical sound.

Mechanism of crepitations:

- Air passage "Bubbles through fluid".
- Reduction of the lung elasticity with ↓ alveolar compliance (crackles).
- Fluid in the interstitium.

Types and Causes:

Fine (≥ 6 cycles / min)	Medium (3 - 6 cycles / min)	Coarse (1 - 2 cycles / min)
• Early pneumonia. • Early T.B. • Early interstitial lung disease. • BBC	• Pneumonia. • T.B. • Lung abscess. • Bronchiectasis.	• Late pneumonia. • Late T.B. • Lung abscess. • Bronchiectasis. • APO

it can be :

- **Generalized:** Pulmonary edema.
- **Localized:** bilateral basal Crepitations.

Effect of Cough :

- Air passage "Bubbles through fluid" :change by cough.
- Reduction of the lung elasticity as in fibrosis : not changed with cough.

► N.B.

Early inspiratory crepitations may occur in COPD, called opening snap of the chest, but late inspiratory crepitations indicate infection.

► N.B.

Consonating or non consonating.

Consonating = metallic tone (in medium sized crepitations = surrounded by consolidations).

3. Rub (pleural rub)

Definition: it is a stitching friction gritty sound, disappears by holding of breath.

Causes: Pleural Diseases Pleurisy (dry or with effusion).

D.D:

- Pericardial rub (with heart beats).
- Friction of the stethoscope: disappears by firm pressure

effect of cough: Unchanged.

Timing with Resp Cycle : Inspiratory & expiratory.

4. Vocal Resonance:

Definition: it is vibrations of the vocal cord transmitted through airway and chest wall to be auscultated.

Called: voice sound

Diminished in all chest lesions except: 3 Cs

- Consolidations.
- Collapse or fibrosis with patent bronchus.
- Cavity if superficial & surrounded by consolidations.

Method: patient say 99 "44 in Arabic"

Bronchophony: in a loud voice.

Whispering pectology: by whispering "diagnostic".

► N.B.

- Aegophony is heard in upper border of pleural effusion with nasal tone.
- E to A changes: is a variant of aegophony.

INVESTIGATIONS IN CHEST

Scheme for investigations

1. Aetiological Diagnosis.
2. Anatomical Diagnosis.
3. Functional Diagnosis.
4. Pathological Diagnosis.

1. Aetiological Diagnosis

- Patch test in allergic Bronchial Asthma.
- investigations for T.B → See Theoretical Book.

2. Anatomical Diagnosis

- by Plain X ray as a simple rapid investigation.

3. Functional Diagnosis

- a- Compensation :**
by ABG for detection of Resp. Failure.
- b- Complications :**
as Cor pulmonale : ECG and Echo.

4. Pathological Diagnosis

Scheme for investigations

1. Laboratory.
2. Radiological.
3. Pulmonary Function Tests.
4. Bronchoscopy.

1. Laboratory:

1. CBC.

Indication	Values
polycythemia	in chronic hypoxia as COPD & IPF.
eosinophilia	in Allergic BA.
Anemia	in chronic toxic Diseases.
Leucocytosis	with infection.

2. Sputum Analysis.

- eosinophils in BA.
- For Culture & Sensitivity for Detection of Causative organism & Suitable Antibiotic.

3. Serous Fluid Analysis (Pleural Aspiration):

for detection of nature of effusion.

4. Sweet Test: for Cystic Fibrosis.

5. Serum α 1 antitrypsin level: in primary Emphysema.

2. Radiological:

- **X ray :**
for detection of many diseases as Pleural effusion, Pneumothorax, SLS, COPD ... etc.
details in Paraclinical book.
- **CT scan :**
is investigation of choice for many Diseases as : SLS & Lung Fibrosis.

3. Pulmonary Function Tests.

1. for accurate Diagnosis by Spirometry that detect several vital volumes and capacities.

- **Forced Vital Capacity (FVC)** = Max. volume of air expired by deep expiration after deep inspiration.
- **Forced Exp. Volume in the 1st second (FEV 1)** = Max. volume of air expired by deep expiration after deep inspiration in the 1st second.
- **Timed Vital Capacity (TVC) or Forced Exp. Ratio (FER)** = $FEV\ 1 / FVC = (70\% : 80\%)$.
 - if more than 80% means restriction airway disease as fibrosis.
 - if less than 70% means obstruction.
then repeat Test again after administration of Bronchodilators:
 - if improved **more than 15%** means **BA**.
 - if improved **less than 15%** means **COPD**.

► N.B.

Residual Volume (RV): volume of air present in lung after deep expiration ↑ in COPD & ↓ in fibrosis, but can not detected by Spirometry :)

2. For Follow up (Flowmeter)

that means Peaked Exp. Flow Rate. (PEFR)

(Max. amount of air expired by deep expiration in a minute.)

For Example:

BA with PEFR > 80% = mild
60 : 80 % = moderate
< 60% = severe.

4. Bronchoscopy.

Diagnostic

- Good Visualization.
- take a biopsy.

Therapeutic

- remove FB or mucous plug.
- injection of AB in Abscess or Cytotoxic in Malignancy.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Definition

1. Chronic obstructive bronchitis & emphysema commonly coexist and the condition is known, chronic obstructive pulmonary disease (COPD).
2. Persistent ↑ in airway resistance.
3. Persistent ↓ in FEV1.

Aetiology

1. Chronic obstructive bronchitis:

- Irritation: smoking & pollution.
- Allergy.
- Infection.

2. Emphysema

False	True
• Senile • Compensatory • Congenital	• Primary: α 1 antitrypsin deficiency. • Secondary: Infections-obstruction

Pathological stages of Chronic obstructive bronchitis:

1. **Simple chronic bronchitis:** reversible chronic irritation of bronchi with excessive mucus secretion (e.g. smoking cough)
2. **Muco-purulent chronic bronchitis:** recurrent infection of the bronchi
3. **Obstructive chronic bronchitis:** irreversible narrowing caused by (sub-mucosal thickening - sub-mucosal inflammatory cell infiltration - muscular hypertrophy) - usually complicated with emphysema.

Pathophysiology

1. Chronic obstructive bronchitis.

Respiratory dysfunction:

- Obstructive hypoventilation
- Hypoxaemia & hypercapnia

Later on pulmonary hypertension & cor pulmonale (RVF)

Hypercapnia decreases the sensitivity of respiratory centre. So no dyspnea.

Type B - bronchitic Type or "Blue Bloater".

2. Emphysema

Respiratory dysfunction:

- Diffusion defect (decreasing surface area).
- Hypoxia + normo- or hypocapnia.

Sensitivity of respiratory centre is normal
(no hypercapnia) severe dyspnea.

Type A, emphysematous Type "Pink puffer"

3. Cor pulmonale:

- Hypoxia: resulting in vasoconstriction of pulmonary arterioles.
- Reduction of the pulmonary vascular bed.

► **Chronic obstructive bronchitis:** Disease characterized by cough daily or most of days for about 3 months / year for 2 successive years

► **Emphysema:** Disease of respiratory unit dilatation, with or without damage of alveolar wall.

Clinical Picture

Symptoms

Patient: Male, chronic heavy smoker & above 50 years

Bronchitis: Long history of chronic cough with mucoid or mucopurulent expectoration.

Emphysema: Dyspnea is gradual progressive occurring initially on exertion but later on at rest $\pm$ wheeze.

Complications: Chest pain (Chronic cough, pneumothorax) Respiratory failure Oedema of lower limbs (RVF)

Signs

1- General examination (A, B, C, E & F)

A

Pulse:

- Tachycardia & big pulse volume hyperdynamic Circulation. (hypercapnia & hypoxia)
- Small pulse volume severe pulmonary hypertension $\pm$ heart failure
- Pulsus paradoxus may be present in severe cases.

Respiratory rate:

Tachypnea with working accessory respiratory muscles.

C

Cyanosis (in severe hypoxia)

D

May be Orthopnic.

(H & N):

- Central cyanosis may be present.
- Puffiness of eyelids due to chronic cough
- Congested neck veins (increased intrathoracic pressure, Cor-pulmonale, RVF)

E

upper limb:

Clubbing: if associated bronchiectasis

lower limb: Oedema of the lower limbs may occur due to cor-pulmonale

F

Drowsiness: Sign of respiratory failure.

2- Abdominal examination:

Palpable liver due to :

- Depression of the liver by flat diaphragm (not tender)
- Congested liver due to cor pulmonale (tender)
- Ascites may be present: due to right-sided heart failure

3- Local Chest examination:

► Inspection

- Barrel chest.
- Bilateral limitation of expansion.
- Weak or absent cardiac pulsations

► Palpation

- Trachea is central.
- TVF is decreased bilaterally

► Percussion

- Hyperresonance.
- Encroachment on cardiac & hepatic dullness.

Hyperinflation

► **Auscultation**

- Vesicular breath sounds with prolonged expiration (harsh).
- Generalized wheezes (rhonchi).
- Minimal crepitations may occur

► **Complications.**► **Local****Respiratory:**

- Respiratory failure.
- Infections.
- Bronchial obstruction.
- Pneumothorax

► **Extra-thoracic****CVS:**

- Cor pulmonale
- Right-sided heart failure
- Left-sided heart failure
- Thromboembolism.
- Erythrocytosis

Renal:

- Salt & fluid retention
- Proteinuria

GIT:

- Peptic ulcer

Causes of Lt. V. F in COPD:

- Associated Disease of the left side of the heart especially Coronary artery disease.
- Reversed Bernheim effect.
- Acidosis leading to myocardial depression.
- Hypoxia leading to myocardia; ischemia.
- volume overload due to hyperdynamic circulation (VD)
- ↑ blood viscosity due to polycythemia.

► **Complications of chronic cough**

see symptomatology

► **Investigations**► **Chest X-ray**

- **Hyperinflation:**
 - Hypertranslucency of the lungs.
 - Transverse & wide intercostals spaces.
 - Low flat diaphragm.
 - Ribbon-shaped heart.
- **Exaggerated broncho-vascular markings** (chronic obstructive bronchitis)

► **Sputum culture & sensitivity**

- may detect organisms (pneumococci & H. influenza)

► **Blood Picture**

- may show erythrocytosis

► **Respiratory function tests**• **Ventilation tests:**

- Residual volume (RV) is increased..
- Forced vital capacity (FVC) usually decrease.
- FEV1, timed vital capacity & PEFR are decreased

• **Diffusion tests:** CO transfer factor is decreased.• **Arterial blood gases:** Decreased PO₂, increased PCO₂► **Treatment**► **General**

- Avoidance of the cause (bronchial irritation or infection).
- Cigarette smoking should be stopped.
- Changing residence.
- Proper treatment of upper respiratory infections.
- Pneumococcal vaccination

► **Symptomatic treatment**

- **Mucolytics** e.g. bromhexine hydrochloride (bisolvon).
- **Expectorants** e.g. potassium iodide.
- **Bronchodilators** e.g.
 - Ipratropium bromide by inhalation.
 - Aminophylline IV or orally.
 - Steroids (in resistant cases)

• **Thiophylline.**

- Corticosteroids. (in acute exacerbation or in patients with overlap asthma).
- **Antibiotics.**
- **α 1 antitrypsin replacement** (congenital emphysema).

► **Treatment of complications**

- Respiratory failure.
- Heart failure.
- Erythrocytosis : venesection may be needed

► **Oxygen therapy (long term)****It is indicated in:**

- Severe hypoxia.
- PO₂ <40 mmHg with exertion or <55 mmHg at rest.

Values:

- Decrease complications.
- Improve symptoms, exercise tolerance, quality of life & survival

► **Lung transplantation** is the only radical treatment.

LUNG ABSCESS

Definition

Localized suppurative of the lung associated with cavity formation, often with a fluid level on the chest X-ray.

Aetiology

1. Primary (Aspiration lung abscess) common :

This involves introduction of infected material down the respiratory passages, to the lungs.

Accordingly there should be:

• Absent cough reflex:

- Coma.
- Convulsions.
- Anesthesia.
- Old age.
- Bulbar paralysis

• Source of infected material:

- FB aspiration in children.
- Vomiting.
- Zencker's diverticulum.
- Esophageal tumors.
- Reflex oesophagitis.
- Blood (in upper air way surgery or with hematemesis).
- Alcohol abuse

• The causative organisms include:

anerobes , staphylococcus, streptococcus, H. influenza.

2. Secondary lung abscess:

from the 4 surrounding structures + 1

1. **Lung:** spread from the lung diseases as pneumonia (especially staphylococcal and Friedlander's pneumonia), TB, Lung abscess, infarction and malignancy .
2. **Mediastinal:** spread from the mediastinal diseases as pericarditis, mediastinitis or malignancies.
3. **Chest wall:** spread from the chest wall as fracture ribs or osteomyelitis.
4. **Subdiaphragmatic:** spread from behind the diaphragm as amebic or pyogenic liver abscess, subphrenic abscess or pancreatitis.
5. **Pyæmia :** (pyæmic abscesses) : may occur due to e.g. infective endocarditis, septic thrombophlebitis, osteomyelitis (septic focus). Caused by Staph. Aureus.

Pathology

A- Pathology of inhalation abscess:

- **Site:** it is usually solitary, occurring more commonly in the right lower lobe (the right bronchus is wider and more in direct continuity with the trachea).
- **Passes through 3 stages:**
 - **Pneumonic stage:**

Consolidation involves an entire single lung lobe and passes in the following stages.

1. **Congestion:** Inflammatory reaction due to the presence of organism → BVs show VD → exudates collect in alveoli.

2. **Red hepatization:** alveoli are filled with RBCs and few WBCs.

3. **Gray hepatization:** the release of proteolysis enzymes from WBCs → lysis of RBCs and bacteria

4. **Resolution:** liquefaction of exudate to be excreted and absorbed by blood and lymphatics. In all stages the overlying pleura may show evidence of pleurisy.

• **Stage of acute abscess:**

- Tissue necrosis and suppurative occur in the consolidated area.
- Rupture into the draining bronchus leaving a cavity.
- characterized by irregular necrotic wall and surrounded by consolidated area.

• **Stage of chronic abscess:**

- The abscess wall becomes thickened by fibrous tissue.
- The covering pleura may show thickening and fibrous adhesions.

B- Pathology of pyæmic abscesses:

They are usually bilateral, multiple, small and of equal size.

C- Pathology of secondary abscesses:

Related to the site of primary lesion: e.g. abscess on top of cancer

Clinical Picture

There are three stages :

- Pneumonic = pneumonia.
- Acute abscess.
- Chronic abscess = chronic empyema.

Pneumonic stage Symptoms and signs : as

- Fever:
 - Starts acutely.
 - May reach 39 - 40°C.
 - Ends by crisis (drop to normal within 12 hours in patients not receiving antibiotics or antipyretics).
- Tinge of jaundice because of RBCs lysis. Working anasarca and cyanosis in severe cases.
- Herpes simplex eruption around lips.
- Convulsions in children with neck rigidity (meningism)

Local:

- Inspection:
 - Normal shape of chest.
 - Restricted movement on affected side.
 - Mediastinum central.
- Palpation:
 - Tenderness on affected side.
 - ↑ TVF over the affected lobe.
 - Trachea central.
 - Palpable rub may be present.
 - Respiratory movement restricted on affected side.
- Percussion: Dullness taking shape of affected lobe + tenderness due to pleurisy.
- **Auscultation:** On the affected side there may be:
 - Bronchial breathing.

- Consonating rales (Fine in early stages, then becomes Consonating in hepatization stage and coarse non Consonating in resolution stage).
- Aegophony and whispering pectrilquy.
- Pleural rub

Acute abscess stage (after 9-12 days)

Symptoms

- Productive cough with:
 - Excessive purulent sputum.
 - Fetid (anaerobic bacteria).
 - ↑ With lying on healthy side.
- Dyspnea: 2ry to pleurisy and consolidation.
- Pleuritic chest pain.
- Constitutional manifestations (FAHM) which improve with clearing of pus by cough.

Signs

- **General:** Fever and tachycardia.
- **Local:**

► Inspection

- Shape: Normal.
- Movement restricted on affected side.
- Mediastinum: Central.

► Palpation

- Tenderness on affected side.
- ↑ TVF on affected side.
- Trachea: Central.
- Palpable movement restricted on affected side.
- Palpable rub.
- Apical pulsations are not displaced.

► Percussion

- Dullness on affected site.

► Auscultation

- Bronchial breathing of cavernous type.
- Consonating crepitations.
- Pleural rub.
- Aegophony and whispering pectrology on the affected side.
- Post tussive suction may be heard after prolonged cough in collapsible cavity.

Chronic abscess stage

Symptoms as acute abscess +

- **Retention syndrome:** attacks of bronchial obstruction by thick mucus pellets → fever + cessation of purulent sputum → this is followed by violent cough with expectoration of thick, blood tinged mucus pellet and return of suppurative syndrome features and drop of fever.
- **Deterioration of general health.**

Signs

- **General:**
 - Bad general condition with loss of body weight and recurrent fever.
 - Buffy eye lids from chronic cough.
 - Clubbing and possibly pulmonary osteodystrophy.

• Local

► Inspection

- Shape: Normal or retracting.
- Movement: Restricted on affected side.
- Mediastinum: Shifted to same side of lesion.

► Palpation

- Trachea: May be shifted to same side of the lesion.
- Tenderness on affected side.
- ↑ TVF on affected side.
- Palpable rub on affected side.
- Apical pulsations may be shifted to the same side of lesion.
- Respiratory movements are restricted on the affected side

► Percussion

- Dullness over the abscess.

► Auscultation

- As acute abscess.

Complications

1. Chest complications

- Severe haemoptysis.
- Spread of infection to other parts of the lung leading to recurrent pneumonia & abscesses.
- Fibrosis & bronchiectasis around the abscess cavity.
- Pleurisy, effusion, empyema, pyopneumothorax & pleural fibrosis.

2. General complications

- Metastatic abscesses especially in the brain.
- Anaemia & amyloidosis in chronic cases.

Signs of a cavity are variable depending on :

- Site: superficial or deep.
- Size: small or large.
- Surroundings: consolidation or fibrosis.
- Draining bronchus: patent or occluded.
- Contents: full or empty.

Investigations

► laboratory

- **Sputum culture & sensitivity.**
- **Blood:** Leucocytosis and blood culture may be +ve in pyaemic abscesses.
- **Tuberculin test:** For suspected T.B.

► Radiological

- **Chest X-ray:**
 - Cavity with fluid level.
 - The cavity is thin walled and irregular in acute abscess, while it's thick and regular with possible mediastinal shift to the same side in chronic abscess.
- **CT chest:**
 - Localizes abscess site.
 - May help to define the underlying cause.

► Bronchoscopy

- Diagnostic and Therapeutic.

Treatment

(4 as in any infectious disease) + **Pus drainage + Surgical)**

1. General: - Bed rest - plenty of fluid - nutrient diet.

2. Symptomatic:

- Antipyretics for fever e.g. paracetamol.
- Analgesics for pain.
- Mucolytic and expectorant (bromhexine) and steam inhalation to liquefy thick sputum.
- oxygen therapy in severe cases.

3. Specific (Antibiotics + pus drainage):**A. Antibiotics:**

- Should cover both aerobes and anaerobes.
- Initial treatment should include IV:
 - Metronidazole 500 mg/8 hrs or clindamycin 600 mg/8 hrs (for anaerobes).
 - Amoxycillin – clavulanic acid 1gm IV / 8 hrs.
- Treatment should be continued then according to culture and sensitivity.

B. Drainage of pus:**• Postural change:**

Patient should lie on the healthy side 2-3 times/day for few minutes with percussion of affected side.

• Bronchoscopic aspiration:

- Allows removal of thick pus and any bronchial obstruction.
- With injection of antibiotics (is rarely used).

• Percutaneous drainage:

By CT guided Percutaneous catheter insertion

• Treatment of complications**Surgical lobectomy or segmentectomy if:**

- Failed medical treatment.
- Huge abscess (> 4 cm).
- Surrounding bronchiectasis or suspected malignancy.
- Complicating empyema or pyopneumothorax

BRONCHIECTASIS**Definition**

Abnormal and permanent dilatation of the central and medium-sized airways (bronchi and bronchioles) with suppuration.

Aetiology**1. Congenital bronchiectasis (2)****1. Primary:** Isolated bronchiectasis**2. Secondary:****1. Immotile cilia syndrome**

- Bronchiectasis.
- Sinusitis & otitis media.
- Male sterility.
- May be associated with dextrocardia & situs inversus totalis (Kartagener's syndrome).

2. Cystic fibrosis.**3. Immunodeficiency syndromes****2. Acquired bronchiectasis (2)****1. Infection and Fibrosis:**

- Destruction of the bronchial muscles & elastic fibers resulting in bronchial dilatation.
- Peribronchial fibrosis causes traction over the bronchi leading to further dilatation.
- (As, bronchopneumonia, whooping cough, measles, TB & lung abscess especially during childhood).

2. Bronchial obstruction:

- Partial obstruction: valve-like mechanism
- Complete obstruction.

Pathology

- **Site:** bilateral & basal, But may be apical in TB or localized in foreign body or tumor.
- **Shape:** bronchi may be cylindrical, tubular, fusiform or serpentine.
- **Changes:** bronchi are dilated with desquamation & ulceration of the mucous membrane.
- **Others:** The surrounding lung tissue may show consolidation, Emphysema of the upper parts of the lungs.

Clinical Picture**Symptoms**

- **Dyspnea:** secondary to:
 - Bronchitis and emphysema
 - Fibrosis
 - Pneumonia
- **Cough:** productive cough with purulent, fetid sputum that increases by leaning forward or lying down and with winter exacerbation.
- **Haemoptysis:** either blood tinged sputum or frank blood. In cases secondary to TB the patient may present only by haemoptysis (Bronchiectasis sicca hemorrhagica)
- **Wheezy chest** due to associated bronchitis.
- Chest pain secondary to:
 - Repeated coughing
 - Associated pleurisy or complicating pneumothorax.
- **Constitutional manifestations:** FAHM.
- **Symptoms of the cause:** e.g. sinusitis (commonly associated).
- **Symptoms of complications:** e.g. empyema

Signs**General:**

- **Puffy eye lids:** due to:
 - Repeated coughing with increased intrathoracic pressure interfering with venous return.
 - As a part of the generalized edema from cor pulmonale or amyloidosis.
- **Right ventricular enlargement** secondary to pulmonary hypertension.
- **Clubbing and pulmonary osteodystrophy.**
- **Lower limb edema:** secondary to:
 - Cor pulmonale
 - Amyloidosis
- **Loss of body weight and pallor**

Local:

(Basal fibrosis and consolidation + apical emphysema).

► Inspection

- **Shape:** basal part may show retraction (Fibrosis) and the upper part may be bulging(emphysema)
- **Movement:** restricted bilaterally mainly on the basal part.
- **Apex:** not shifted unless bronchiectasis is unilateral.

► Palpation

- **Trachea** is central unless the bronchiectasis is unilateral
- **Tenderness:** may be present on the affected side
- **TVF:** ↑ on the basal part but decreased on the upper part of the chest.
- **Movement** restricted on the basal part mainly
- **Rub or rhonchi** may be felt on the affected side.
- **Apical pulsations** are not shifted unless bronchiectasis is unilateral.

► Percussion

Bilateral basal dullness, with hyper-resonance on the apical part of the chest.

► Auscultation

- Bilateral basal bronchial breathing, crepitations, whispering pectrilequy, aegophony and possibly rub
- In the apical part there may be vesicular breathing with prolonged expiration, and wheezes

Complications As L. Abscess

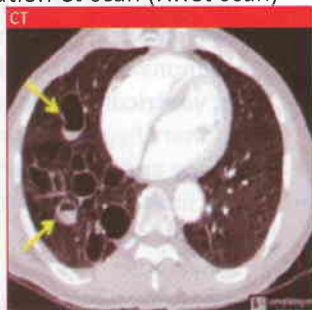
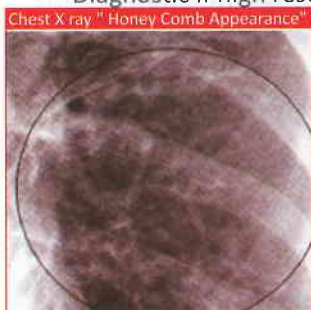
Investigations

► laboratory

- **Blood:** Leucocytosis due to infection and Estimation of serum immunoglobulin level.
- **Sputum culture & sensitivity.** microscopic examination, culture and sensitivity (the most common organisms are H. Influenza, and Strept. Pneumoniae).
- **Tuberculin test.**

► Radiological

- **Chest X-ray:**
 - Basal part may show cystic changes (Honey comb appearance) or thickened bronchial walls (Tram line appearance) surrounded by fluffy cotton areas of pneumonia and fibrosis.
 - Apical part may show hypertranslucency due to emphysema.
 - May show the cause (bronchial tumor) or complications e.g. cor-pulmonale.
- **CT chest:**
 - Diagnostic if high resolution Ct-scan (HRCT-scan)



► Instrumental

• **Bronchography (obsolete):**

- It was the investigation of choice to confirm the diagnosis and to localize the site, extent of bronchiectasis before surgery.
- Bronchiectasis appears as cylindrical, saccular, fusiform or varicose dilatation of the bronchi.
- Using Lipidol was used to diagnose the condition by demonstrating the dilated bronchi before surgery

• **Bronchoscopy:**

- **Diagnostic:**
 - Show the cause of bronchial obstruction
 - Sample the sputum for culture and sensitivity.
- **Therapeutic:**
 - To remove obstructing foreign body.
 - To suction pus and inject antibiotics.

► investigations for the etiology

as Sweat test for Cystic Fibrosis.

Treatment

(4 as in any infectious disease) + **Pus drainage + Surgical)**

1. General:

- Bed rest.
- plenty of fluid
- nutrient diet.

2. Symptomatic:

- Antipyretics for fever e.g. paracetamol.
- Analgesics for pain.
- Mucolytic and expectorant (bromhexine) and steam inhalation to liquefy thick sputum.
- oxygen therapy in severe cases.

3. Specific (Antibiotics + pus drainage) :

A. Antibiotics:

- According to culture and sensitivity
- Start with:
 - Ampicillin 500 mg/8 hrs
 - Ciprofloxacin: 250 mg/8hrs
 - Sutrim : 2 tab/12 hrs
- If the sputum is fetid: add an antibiotic that covers anaerobic organisms e.g. metronidazole (Flagyl) or clindamycin (Dalacin).

B. Drainage of pus:

• **Postural change:**

Patient should lie prone 2-3 times/day and it may be helped by percussion .

• **Bronchoscopic aspiration:**

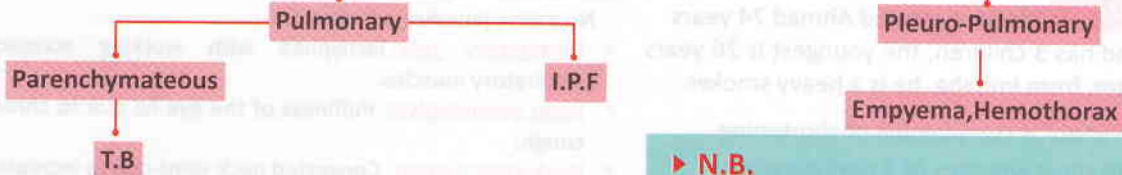
- Allows removal of thick pus and any bronchial obstruction.
- With injection of antibiotics (is rarely used).

• **Treatment of complications**

Surgical lobectomy treatment if:

- Persistent or recurrent infection not responding to medical treatment.
- Severe haemoptysis.
- Surrounding abscesses or suspected malignancy.
- Complicating empyema or pyopneumothorax.

FIBROSIS



Syndrome of Multiple Negative:

- **Inspection:** No movement
- **Palpation:** NO TVF.
- **Percussion:** NO note.
- **Auscultation:** NO Sound.

► N.B.

Syndrome of Multiple -ve includes:

Pleural Effusion, Fibrosis, Collapse.

- **in Pleural Effusion** → Bulge.
- **Fibrosis** → Retraction & heterogeneous Dullness.
- **Collapse** → Retraction & homogeneous Dullness.

INTERSTITIAL PULMONARY DISEASE

Aetiology

- **Idiopathic pulmonary fibrosis (IPF).**
- **Immune diseases.**
- **Inhalational lung diseases.**
 - **Extrinsic allergic alveolitis:** (due to inhalation of organic dust) e.g.
 - Farmer's lung
 - Bird fancier's
 - Bagassosis disease.
 - **Pneumoconiosis:** (due to inhalation of inorganic dust) e.g. Silicosis & Asbestosis.
- **Chronic pulmonary diseases** (Granulomatous) e.g. Sarcoidosis.
- **Chronic pulmonary venous congestion.**
- **Familial:**
 - Histiocytosis X.
 - Neurofibromatosis.
- **Malignancies:**
 - Lymphangitis carcinomatosa.
 - Bronchoalveolar carcinoma.
 - Lymphomas & Leukaemias.
- **Miscellaneous**
 - Idiopathic haemosiderosis.
 - Alveolar proteinosis.
 - Alveolar microlithiasis

Pathophysiology

1. Impaired diffusion.
2. Restrictive hypoventilation.
3. Hypoxia with normo or hypocapnia.

Clinical Picture

Gradual progressive **dyspnea**.

Cough. **Central Cyanosis.** **Clubbing.**

Crepitations: late or pan-inspiratory medium-sized, non-consonating.

Cause e.g. occupational exposure to dust.

Complications:

- Respiratory failure.
- Pulmonary hypertension & Cor pulmonale
- Pulmonary infections.

Investigations

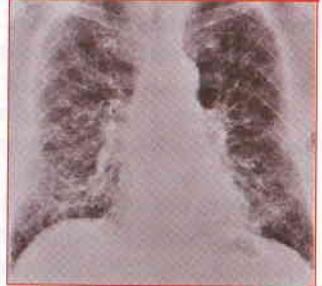
► Chest X ray

Bilateral diffuse affection of lungs with reticulations & micronodular infiltrations (usually basal).

Normal Chest X ray



micronodular infiltrations in IPF.



► Pulmonary Function Tests

- Ventilation test.
- Decreased lung volumes especially forced vital capacity.
- Decreased lung compliance
- Normal expiratory flow rates
- Diffusion tests: Decreased CO transfer factor.
- Arterial blood gases:
 - Decreased PO₂.
 - Decreased PCO₂.

► Investigations for the Cause

Disease Activity

1. **Open lung biopsy:** (Old)
2. **Bronchoalveolar lavage:** (Recent)
For detection of type and amount of inflammatory cells.
3. **Gallium 67 lung scan.** (Recent)

Treatment

1. **Treatment of the cause.**
2. **If the condition is of unknown aetiology e.g. IPF:**
 - **Steroids:** prednisone 1 mg/kg/d.
 - **Cytotoxic drugs:** e.g. Cyclophosphamide.
3. **Symptomatic treatment:** e.g. oxygen therapy.
4. **Treatment of complications:**
 - Pulmonary infections.
 - Respiratory failure.
 - Heart failure.

CHEST (LONG CASE)

► 1. History

Personal history Mr. Muhammad Ahmad 74 years old, married and has 3 children, the youngest is 26 years old, he is a waiter, from Imbaba, he is a heavy smoker.

Complaint Patient is complaining of shortening of breathing and chest wheezes of 3 days duration.

Present history

The condition started 30 years ago by gradual onset and progressive course of **cough**, especially at early morning and winter time, increased by exertion, decreased by rest, associated with **expectoration of sputum** which was; scanty, whitish, thick, not foetid and had no special character. The expectoration used to increase in the early morning and winter time, but: there was no postural variations.

Two years later, the patient started to suffer from exertional **dyspnea**, with gradual onset & progressive course, increased by exertion, decreased by rest, not associated with orthopnea or PND, but: it was associated with persistent **wheeze**.

Patient sought medical advice and was admitted to Demirdash hospital where some investigations were done to him in the form of chest X-ray, sputum analysis which was negative, in addition to the usual routine laboratory work-up.

He received bronchodilators (Aminophylline) by infusion, cortisone, antibiotics (Flumox), oxygen inhalation and doses of bronchodilators by nebulizer when needed. He received this medication for 2 weeks till his condition was stabilized & was then discharged.

His condition partially improved, but he used to suffer from repeated attacks of severe dyspnea and wheezes improved by received his usual regular medication.

Six years later, the patient started to suffer from gradual persistent dull aching **pain** in his right hypochondrium increasing by meals & by exertion associated with **oedema** of his lower limbs but with no ascites. He sought medical advice again where diuretics (lasix) were added to his usual medication & was advised proper bed rest. The oedema disappeared & the pain partially improved & his condition is stationary as such up till now.

There was no haemoptysis, no cyanosis, no compression symptoms, no symptoms of T.B. toxemia & no symptoms of respiratory failure. There were no symptoms of other systems affection.

Past history There is no past history of DM, HTN, T.B., allergy, Bilharziasis. There is no past history of previous operations, or blood transfusion.

Family history Family history is irrelevant.

Diagnosis A case of bilateral lung disease most probably COPD due to chronic irritation, the patient compensated and complicated by cor-pulmonale.

► 2. General Examination

The patient with an average general condition, fully conscious, oriented by time, place and persons, with good mood and memory, co-operative with an average intelligency.

The patient with an average built for his age, he lies comfortable in bed.

No pallor, jaundice or cyanosis.

- **Respiratory rate:** Tachypnea with working accessory respiratory muscles.
- **Head examination:** Puffiness of the eye lid due to chronic cough.
- **Neck examination:** Congested neck veins due to increased intrathoracic pressure, or cor-pulmonale.
- **Upper limbs examination**
 - **Pulse:** 80 beats / min., regular, variable volume, equal in both sides, pulsus paradoxicus > 15 mmHg. (marked drop of systolic pulse during inspiration).
 - **Blood pressure:** 110 / 75 mmHg.
 - No hand clubbing.
- **Lower limbs examination:** Oedema of lower limbs (cor-pulmonale or less commonly salt and water retention).
- **Abdominal examination** (not in this patient)
 - Lower border of the liver may be displaced downwards due to (ptosed liver by flat diaphragm or enlarged liver due to cor-pulmonale).
 - Umbilical or inguinal hernia may be present as a complication of chronic cough.
 - No ascites (only if RSHF occurred).
- **Cardiovascular examination**
 - Absent apex (emphysema).
 - Faint heart sounds.

► 3. Local Examination

Inspection**Shape of the chest**

- Barrel shaped chest (emphysematous) with increased anteroposterior diameter.
- Relatively low-lying diaphragm.
- No scars, dilated veins or pigmentation.
- There is epigastric pulsation & left para sternal pulsation. (right ventricle enlargement).

Respiratory movement

- Diminished bilaterally.
- Mainly abdominal respiration.
- Suction of supra clavicular, supra sternal & lower intercostals spaces during inspiration and fullness during expiration

Palpation

- Central trachea.
- No tenderness.
- T.V.F.: equal on both sides (diminished all over the chest).
- There is palpable wheezes with deep respiration.
- Bilateral limitation of chest expansion

Percussion

- Hyper-resonance all over the chest.
- Encroachment on the normal hepatic & cardiac dullness

Auscultation

- Diminished air entry.
- Vesicular breath sounds with prolonged expiration. Generalized wheezes (diffuse, mainly expiratory, polyphonic, changes with cough).
- Crepitation: early inspiratory (opening snap of the chest).
- No vocal resonance.



ABDOMEN

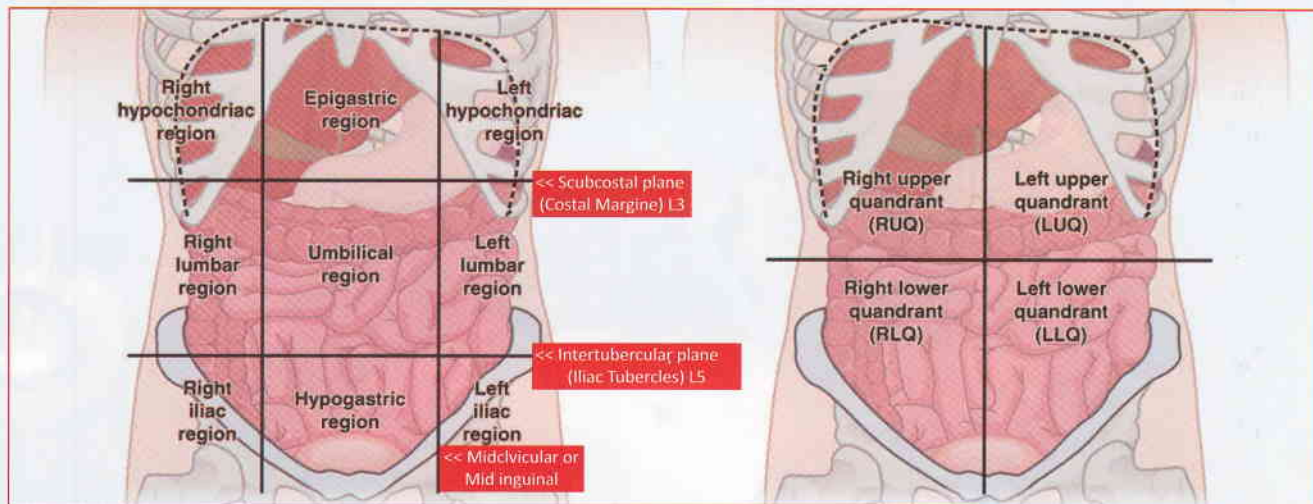
”

Rare presentations of common diseases are much more common than common presentations of rare diseases.

”

INTRODUCTION

► Surface anatomy of the abdomen:



The abdomen can be divided into quadrants by a vertical median plane and a horizontal transumbilical plane, which passes through the umbilicus.

- The liver and gallbladder are in the **right upper quadrant**.
- The stomach and spleen are in the **left upper quadrant**.
- The cecum and appendix are in the **right lower quadrant**.
- The end of the descending colon and sigmoid colon are in the left **lower quadrant**.

The abdomen also can be divided into nine regions by a midclavicular sagittal plane on each side and by the subcostal and intertubercular planes, which pass through the body transversely. These planes separate the abdomen into:

- three central regions (**epigastric, umbilical, hypogastric**)
- three regions on each side (**hypochondrium, lumbar, iliac**)

► N.B.

The level of the diaphragm varies during the breathing cycle. The dome of the diaphragm on the right can reach as high as the fourth costal cartilage during forced expiration.

Most of the liver is under the right dome of the diaphragm and is deep to the lower thoracic wall.

The inferior margin of the liver can be palpated descending below the right costal margin when a patient is asked to inhale deeply.

ABDOMINAL SHEET

General Local	1- History:	Personal history.	
	2- Examination:	Complaint.	
	3- Investigations.	History of present illness:	Analysis of the complaint.
	4- Diagnosis.	Past history	Symptoms of the related system .
	5- Treatment.	Family history.	Other systems.
		In females (menstrual and obstetric history).	Investigations and treatment history. DM & HTN

ABDOMINAL HISTORY

► Personal History:

1. **Name:** اسم حضرتك ايه؟
to be familiar with the patient.
2. **Age:** عندك كام سنة؟
As certain diseases are more common in certain ages, e.g.
 - **Calcular obstructive jaundice:** middle aged females.
 - **Malignant obstructive jaundice:** old males.
 - **Cirrhosis:** usually in adults.
3. **Sex:**
 - **Gall Bladder stones:** females.
 - **Cancer head of pancreas:** male
4. **Occupation:** بتشتغل ايه؟
persons in certain occupations are more susceptible to certain diseases e.g.
 - **Farmers:** bilharziasis
5. **Marital state:** متزوج؟ عندك اولاد؟ كام؟ اصغرهم عنده كام سنة؟
for possible sterility or impotence.
6. **Residence:** ساكن فين؟
may reflect socioeconomic condition and may occasionally point to certain disease e.g.
Countryside: Bilharziasis
7. **Special habits:**
بتدخن؟ كام سيجارة في اليوم؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
بتشرب خمر أو مخدرات؟ بطريقة منتظمة ولا في المناسبات؟ نوع الخمر ايه؟
e.g. Alcoholism in cirrhosis.
8. **Mensterual History.**

► Complaint:

On patient's own words + duration ؟ ايه اللي تايبك ؟ ايه اللي جابك المستشفى؟ بقاله اد ايه التعب ؟
(take the most recent and most important complaint and it should be brief)

Examples:

the patient is complaining of abdominal swelling of 3 week duration.
the patient is complaining of Vomiting of blood of 2 days duration.

► History of present illness (H.P.I.):

1. Analysis of complaint.
2. Symptoms of the related system.
3. Systemic Review:.
4. Investigation & treatment (related diseases).
5. DM & HTN

HPI should be:

- As long as possible and Contains medical terms.
- In chronological arrangement.
- In the form of a story.

1- Analysis Of The Complaint:

For analysis of any complaint in chest as usual (8) + 3 for any excreta.

8 as usual:

- Onset - course - duration. الشكوى ظهرت فجأة ولا بعد أد ايه ؟ الأعراض ظهرت بالتدريج ولا على مدى أسابيع أو شهور ؟ أو بتحدث في نوبات ؟
- Association. هل كانت مصحوبة بحاجة وتذكر الأعراض الثانية اللي ممكن تكون موجودة ؟
- What increase and what decrease. إيه اللي بيزود العَرَض ده ؟ وإيه اللي بيقلله ؟
- Effect of treatment. تأثير العلاج عليه ؟؟ هل لما بتأخذ العلاج الأعراض بتقل ولا بتفضل زي ما هي ؟
- Date of last attack. آخر مرة جالك العَرَض " وتقول إسم العرض ده " كان إمتى ؟

+ 3 for any excreta:

- Amount.
- Content - Color - Consistency.
- Odour.

2- Symptoms of the related system: (3GPS)

- 3G** E
- **G.I.T. (upper & lower).**
 - **General (toxic).**
 - **Gynecological.**
- 3P** E
- **Pain.**
 - **Biliary system (hepatobiliary).**
 - **Urinary system.** مشاكل في البول
- 3S** E
- **Abdominal swelling.**
 - **Lower limb swelling.**
 - **Systemic review.**

1.GIT :

It's classified according to Ligament of treitz into upper & lower GIT symptoms:

Upper G.I.T.	Lower G.I.T.
1. Appetite. شهيتك على الأكل اتغيرت ؟؟؟ Anorexia / polyphagia. 2. Dysphagia. هل هناك صعوبة في البلع ؟؟ للسوائل أو للأكل ؟؟ 3. Vomiting. حصلك ترجيع ؟؟؟ 4. Haematemesis. رجعت دم قبل كده ؟؟؟ 5. Water brush. بتحسن باللعب مالي فمك ؟ ونفسك غمة عليك ؟؟ 6. Halitosis. رائحة فمك متغيرة ؟؟؟ 7. Heart burn: in GERD. هل عندك حمو على فم المعدة ؟؟؟ 8. Eructation. يتكرع ؟؟؟ 9. Hiccough (idopathic / CRF). بجيلك زغطة كثير ؟؟؟	1. Flatulence. بطنك اتنفخت ؟ وفيه غازات ؟؟ 2. Audible borborygmi. 3. Bowel habit. 4. Haematochezia. فيه دم أحمر مع التبرز ؟؟ 5. Melena. هل هناك براز أسود ؟؟؟

Appetite:**Polyphagia with weight loss:**

- Uncontrolled diabetes Mellitus.
- Thyrotoxicosis.
- Parasitic infestation.
- Malabsorption (Steatorrhea).

Anorexia:

Lack or loss of appetite for food

- Psychological (Anorexia Nervosa) in depression and other psychological troubles
- GIT: Gastritis
- Others: Cancers, TB, sever infection

Parorexia:

Disordered appetite, with craving for unusual foods

- Parasitic infestation with Ankylostoma
- Pregnancy
- Hypocalcemia
- Hysterical.

Dysphagia:

Dysphagia: is difficulty in swallowing & **Odynophagia** is Pain during swallowing.

Casues:

- **Mouth causes:** Glossitis & Stomatitis
- **Pharynx:** Pharyngitis, Tonsillitis & **Plummer Vinson Syndrome**
- **Oesophagus:** Foreign body, Corrosive aticture, **Achalasia & Carcinoma**

For more causes see the theoretical book...

	Achalasia	Carcinoma
Age:	Middle aged	Old
Sex:	Female	Male
Dysphagia for:	Fluids more	Solids more
Odynophagia:	maybe	no pain
General Condition:	good	very bad

Vomiting:

For analysis of any complaint in GIT as **usual (8) + 3 for any excreta (Stress on onset - timing - content)**

Onset:

- Spontaneous.
- Induced >> psychic

Timing:

Early morning	Late in the day	Relation to meal
Central causes	Pyloric obstruction	During >> esophageal. ½ hour after >> G. ulcer. 3 hours after >> D. ulcer.

Content

Mucous	Chronic gastritis - cancer
Bile	Intestinal obstruction
Fecal	Intestinal obstruction or fistula
Parasite	Ascaris
Stone	Fistula
Blood	See (Haematemesis)

Haematemesis:

For analysis of any complaint in chest as **usual (8) + 3 for any excreta.**

Preceded by **Vomiting** and followed by **Melena Dark, tarry stool**

DD:

	Haemoptysis	Haematemesis
Preceded by	Cough	Nausea & vomiting
During		
• Contents	Froth	Food
• Color	Bright red	Dark
• PH	Alkaline.	Acidic
Followed by	Blood tinged sputum	Melena.

Halitosis:**D.D. of Halitosis:**

1. Foetor hepaticus: liver cell failure.
2. Amoniacal: renal failure.
3. Aceton: D.K.A.
4. Foetoid: S.L.S.
5. Local: dental caries.
6. Dietary.
7. Achalasia of cardia

Hiccough:

Definition: abnormal spasmodic contractions of the diaphragm (phrenic nerve irritation).

Aetiology:

General	Chest	Neck	Abdomen
• CRF • Psychic	• Carcinoma • Empyema • Pericarditis	• Rapid thyroid enlargement	• Subphrenic abscess • Hepatic abscess • Splenic abscess • Acute gastric distention • Haemo peritoneum

Changes in the bowel habit:**Diarrhea:**

A condition of having at least 3 loose or liquid bowel motions per day, provided that patient on western diet ;
or: Passage of > 250 gm stool per day

Mechanisms of diarrhea:

- **Hyper motility:** Exaggerated gastro-colic reflex e.g. D.M. - thyrotoxicosis.
- **Osmotic:** Related to food e.g. lactulase.
- **Secretory:** Infection - U.C.
- **Spurious:** after prolonged constipation due to fermentation - rectal masses.
- **Steatorrhea.**

For more causes see the theoretical book...

Tensmus:

Desire of defecation without an actual motion

Dysentery: Bloody stool (Diarrhea + tenesmus)

(passage of mucus & blood with stool) هل فيه ثقل أو تعنية

مع البراز ???

Causes

- **Infective:**
 - Bacterial: bacillary.
 - Parasitic: amoebic and B.
- **Metabolic:** C.R.F.
- **Toxic:** Mercury poisoning.
- **Local causes:** diverticulosis, ulcerative colitis "U.C.", cancer colon or rectum.

For more causes see the theoretical book...

Constipation:

Presence of two or more of the following:

- Infrequent stools < 3 per week
- Hard stools (> third of motions are hard)
- Incomplete evacuation (> third of motions)
- Straining (> third of motions)
- Manual evacuation

For more causes see the theoretical book...

Melena:

Passage of soft black tarry offensive stools, due to upper GIT bleeding (from the oropharynx to end of mid gut) هل هناك براز أسود زي الزيت

Site: above ileo-cecal junction.

Amount: not less than 60 ml.

Duration: > 8 hours.

If less than 60 ml, it is called occult blood in the stool.

If the level below the ileo-cecal junction or the duration less than 8 hours, it is called bleeding per rectum.

D.D.:

- Iron therapy or Bismuth:
- History of drug intake & constipation.
- Hard stool with non offensive odour.

For more causes see the theoretical book...

2. Genral :

Toxic manifestations: FAHM (fever, headache, anorexia and Malaise):

in patients with Hepatitis, L.C.F., Hepatocellular carcinoma & TB enteritis ... etc

3. Gynecological symptoms in female :

Bleeding, Discharge, mass, Hirsutism & hot flushes

4. Pain :

Don't forget (11 points) : 8 as usual + 3 (site, radiation and character).

Types of Abdominal Pain:

Visceral	Parietal (Somatic)	Referred
• Felt at the site of primary stimuli • vague & Diffuse • Types: • Colic: from hollow organs (Obstruction) • Dull ache: from hollow or solid organ (Distention)	• Irritation of the parietal peritoneum • Sharp & Localized	• pain felt at a site other than the site of the stimulus but in the area supplied by the same neural segment • e.g. cholecystitis

Medical causes of Acute Abdominal Pain:

- Addisonian Crisis
- Porphyria
- severe hyper calcemia
- Hemolytic Anemia
- Sickle cell anemia
- Myocardial Infarction
- Acute pleurisy & pneumonia
- Diabetic Ketoacidosis
- Systemic lupus erythematosis
- Rheumatic fever (non infective peritonitis)
- Familial mediterranean feve
- Food poisoning & uremia

Extra-Abdominal Causes of Abdominal Pain:

- Myocardial Infarction
- Herpes zoster
- Acute Pleurisy & Pneumonia
- Dissecting aortic aneurysm
- Torsion of testis & ovary
- Cord compression (Thoracic segment)

► N.B.**Recurrent abdominal pain**

P.U. - Peritonitis - Pancreatitis - chronic
diverticulosis - cancer colon - chronic I. O.

Types of splenic pain:

Stretching of the capsule	Stretching of ligament	Splenic infarction	Splenic abscess
Dull aching	Dragging	Perisplenitis Stitching \ stabbing	Throbbing

5. Biliary (Hepatobiliary) :**Symptoms:**

- Jaundice.
- Pruritis.
- Dyspepsia.
- Pain.

► N.B.**Jaundice may be:**

- Viral : acute - short - regressive.
- Calcular : acute intermittent.
- Malignancy : gradual - progressive (2 Months).
- Chronic liver disease : gradual - intermittent (2Y).

► Jaundice :**Definition:**

yellow discoloration of skin & mucous membranes due to increased level of bilirubin > 2.5 mg %.

Analysis of the jaundice:**1. Onset:**

- **Acute:** viral hepatitis, calcular obstruction.
- **Gradual:** malignant obstruction, cirrhosis.

2. Course:

- **Progressive:** malignant obstruction, cirrhosis.
- **Regressive:** viral hepatitis.
- **Intermittent:** calcular obstructive jaundice, periampullary carcinoma, hemolytic jaundice, chronic active hepatitis.

3. Duration:

- **Short:** viral hepatitis.
- **Long:** cirrhosis.
- **More than 2 years exclude malignancy.**

4. Urine:

- **Dark:** hepatocellular & obstructive.
- **Pale:** hemolytic.

5. Stool:

- **Pale clay:** in obstructive.
- **Dark:** in hemolytic.
- **Slightly pale** in hepatocellular.

6. Anorexia, nausea, vomiting:

Occur at the onset of viral hepatitis.

7. Fever:

- **Hepatocellular:** pre-icteric phase of viral hepatitis.
- **Hemolytic:** during hemolytic crisis - malaria - incompatible blood transfusion.
- **Obstructive:** Charcoat's triad.

8. Bleeding tendency: from skin, orifices in:

- Liver cell failure.
- Obstructive jaundice.

9. Pain:

- **Hepatocellular:** dull-aching pain in right hypochondrium in case of viral hepatitis.
- **Hemolytic:** bone pain and abdominal pain in hemolytic crisis.
- **Obstructive:**
 - Biliary colic (calcular obstruction).
 - Epigastric pain radiating to the back (malignant obstruction).

10. Pruritis:

- In obstructive jaundice.
- Primary biliary colic.

6. Urogenital System

Micturation:

- Pain.
- Micturation difficulties (dysuria).
- Urine abnormalities: volume - colour - frothy.
- Uraemic symptoms.

Uraemic Manifestations:

- Anorexia
- Halitosis (Bad oral odor)
- Hicough
- Disturbed consantration

Sexual:

- Desire.
- Erection troubles.

7. Abdominal Swelling :

Localized	Generalized
• Spleen. • Liver. • Mass.	• Ascites >> History of aspiration: Amount, Aspect, Colour (red = hge.), Complications: fever (infection), wound sepsis, shock & hepatic encephalopathy.

8. Lower limb Swelling :

- L.C.F.
- Bilharziasial Corpulmonale.

► N.B.

Causes of Lower limb edema in LCF are:

1. Hypoalbumenemia
2. Salt and water retention

► N.B.

Causes of ascitis in LCF are:

1. Hypoalbumenemia
2. Salt and water retention
3. portal HTN as a localizing factor
4. Lymphorrhea
5. Associated conditons as SBP or malignancy

9. Systemic review :

3. Other Systems:

CVS: Systemic congestion, pulmonary congestion & low cardiac output manifestation as syncope

Neurology: motor and sensory affection

if nothing involved write

eg. no symptoms suggest other systems affection

4. Investigation & treatment (related diseases):

eg. patient investigated by LFT & US

► Past History :

Diseases	Operations	Drugs
• Bilharziasis. • Hepatitis. • T.B. • D.M. • Hypertension.	History of blood transfusion.	Hepato-toxic • Dose dependant Paracetamol 16 gm. • Non dose dependant • Acute necrosis : INH - PAS. • Cholestasis : aldomet. • Tumors : C. pills

Bilharziasis	hepatitis	
	Subclinical	Clinical
History of contanct to canals. Clinical picture of Bilharziasis. Investigations	Unnoticed	Fever. Jaundice. Dark urine. Fever hospital.
Easily excluded	Can't excluded	

► N.B.

Bilharziasis **NEVER** cause Liver Cell Failure



G.I.T. (upper)

شهيتك على الأكل اتغيرت ؟؟؟ هل هناك صعوبة في البلع للسوائل أو للأكل ؟؟؟
 حصلك ترجيع ؟؟؟ رجعت دم قبل كده ؟؟؟
 بتحس باللعب مالي فمك ؟؟ ونفسك غامة عليك ؟؟؟
 رائحة فمك متغيرة ؟؟؟ هل عندك حمو على قم المعدة ؟؟؟
 بتكرع ؟؟؟ بجيلك زغطة ؟؟؟

G.I.T. (lower)

Flatulence بطنك انتفخت ؟؟؟ وفيه غازات ؟؟؟
 haematochezia فيه دم أحمر مع التبرز ؟؟
 melena هل هناك براز أسود زي الزفت ؟؟؟
 فيه إسهال أو تعنية ؟؟ فيه أصوات من البطن ؟؟

General

فيه ارتفاع في درجة الحرارة ؟؟؟ فيه صداع ؟؟
 فيه فقد للشهية ؟؟؟
 فيه توعك وهمدان في جسمك ؟؟؟

Gyneacological

فيه ألم ؟؟ فيه نزيف ؟؟؟ فيه إفرازات ؟؟؟

Pain

عندك ألم في بطنك ؟؟ بيزيد بإيه ؟؟ ويقل بإيه ؟؟ ومتناسا ال 11 نقطة

Biliary system

لون عينيك بقى أصفر ؟؟؟ ولون البول والبراز اتغير ؟؟؟

Urinary and genital system

مشاكل في البول
 فيه ألم عند التبول ؟؟ البول بيسبقك ؟؟؟
 عندك ضعف جنسي ؟؟؟

Abdominal Swelling

بطنك ورمت ؟؟؟ أو انتفخت ولا لا ؟؟؟

Lower limb Swelling

رجلك ورمت أو نُفُخَتْ ولا لا ؟؟؟

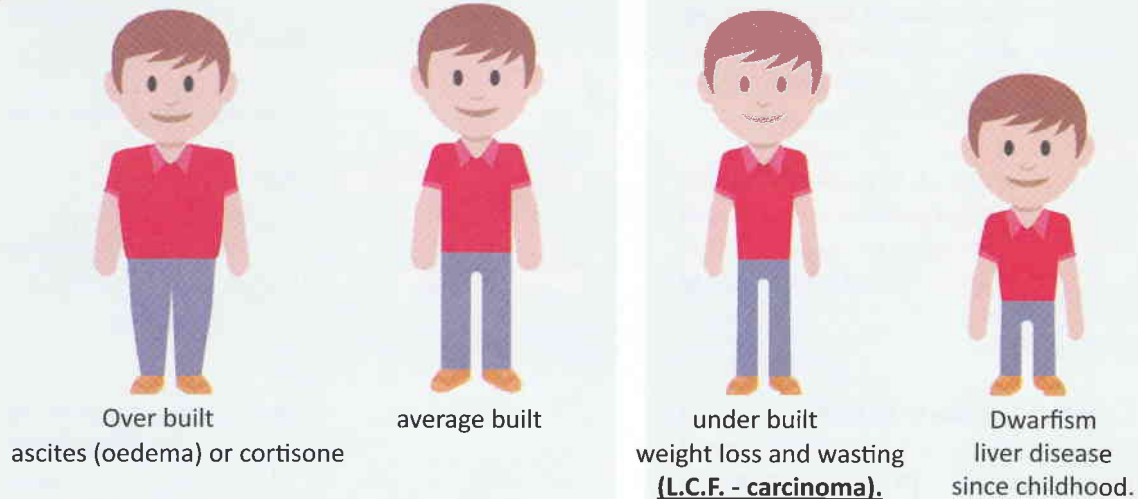
Systemic review

فيه حاجة ثانية بتشتكي منها في بطنك ؟؟
 وتسال المريض برده
 : وتقول
 هل عندك مشاكل في أي جزء ثاني في جسمك ؟؟؟
 عملت فحوصات إيه ؟؟
 وأخذت علاج إيه ؟؟؟

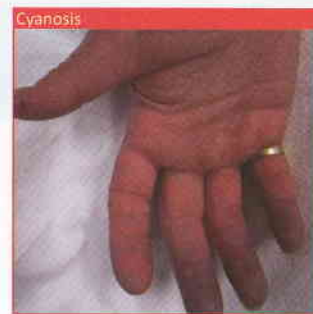
GENERAL EXAMINATION

A أرقام **Vital Signs: Blood pressure, pulse, Respiratory rate, Temperature.**

- **Tachypnea and Respiratory distress:** tense ascites - pleural effusion.
- **Hypotension:** shocked - postural hypotension (VDMs).
- **Pulse:**
 - **Tachycardia:** hyperdynamic circulation (VDMs).
 - **Bradycardia:** in obstructive jaundice.
- **Fever:** low grade.

B **Built:** Over built, average built or under built**C** **Complexion:**

- Pallor:** Anemia (all types may occur).
Jaundice (types).
Hyperpigmented: (Hemochromatosis - L.C.F.).
Cyanosis: tense ascites - porto-pulmonary - A.V. shunt.

**D** **Decubitus or position**

- Orthopnea:** tense ascites - pleural effusion.
Platypnea: hepatopulmonary syndrome: see below

E

(H & N): **Congested neck vein:** tense ascites - pleural or pericardial effusion.

upper limb

lower limb: **Lower limb edema**

Flapping tremors in Hepatic pre-coma

Clubbing

- Crohn's - Ulcerative colitis.
- Biliary cirrhosis.
- B. polyposis.
- Intestinal steatorrhea.

F

Mentality: Disturbed mentality (**Hepatic encephalopathy**).

Face Temporalis muscle wasting + enlarged parotid.

► **Functional evaluation of patient with liver cirrhosis :**

Patient with cirrhosis may be compensated or decompensated (vascular or parenchymatous)

► **Vascular decompensation (portal hypertension) :****Evidences of portal hypertension:**

- **Splenomegaly:** the single most important diagnostic sign. And may lead to hypersplenism.
- **Ascites:**
 - **Early ascites:** acute portal or splenic vein thrombosis.
 - **Late:** related to additional factors as hypo-albuminaemia.
- **Portosystemic anastomosis:**

Location	Portal circulation	Systemic circulation	Consequences
Gastro-esophageal	Coronary V. of stomach	Azygos vein	Gastro -esophageal varices
Anorectal	Middle and superior hemorrhoidal V.	Inferior hemorrhoidal vein	May be mistaken for hemorrhoids
Anterior abdominal wall	Para-umbilical V. in falciform lig. (left portal vein)	Superior & inferior epigastric V.	Caput medusae
Retroperitoneal	• Splenic V. branch. • Veins around liver and diaphragm. • Visceral veins.	• Left renal V. • Abdominal wall V. • Retroperitoneal V.	Between: • Liver & diaph. • Spleen & diaph. • Intestine & post abd. Wall.

Presentation of Portosystemic anastomosis:

1. Asymptomatic (diagnosed by ultrasound or endoscopy).
2. Haematemesis.
3. Internal bleeding.
4. Chronic encephalopathy.

► **Parenchymatous decompensation (L.C.F.) :****Manifestations of liver cell failure:**

- **Jaundice D.D.**
- **Encephalopathy.**
- **Ascites.**
- **Fever (low grade).**
- **Fetor hepaticus D.D.**
- **Flapping tremors.**
- **Fatigue.**
- **Skin changes:**
Spider naevi D.D. - palmar erythema - white nails (Decreased protein).
- **Endocrinal**
 - Gynecomastia.
 - Testicular atrophy.
 - Feminine pubic hair.
 - Hyperaldosteronism.
- **Blood**
 - Anaemia (pallor).
 - Bleeding tendency.
- **C.V.S:**
 - Hyperdynamic circulation.
- **Kidney:**
 - Hepato-renal failure.

For more details about liver cell failure see the theoretical book ...

► **Spider Naevi :**

Central dilated arteriole with radiating capillaries (looks like a spider).

Pressure on central arteriole leads to fading.

Releasing of pressure: the blood refill the "legs of the spider".

Distributed in the upper half of the body (course of the S.V.C.).

Confirmed by:

- Central pressure = blanching.
- Slide test = pulsation.

One or two spider naevi may occur in normal people, thyrotoxicosis or pregnancy.

More than 5 considered as significant and likely to be due to L.C.F.



DD:

	Level	Pruritus	Pressure	Site
Spider naevi	Raised	Not	Fading	SVC course
Insect bite	Raised	Itchy	No	Exposed area
Purpura	Not	Not	Not	LL (common)
Campbell de Morgan spots	Raised	Not	Not	Trunk
Venous star	variable	±	Fading	LL

► Palmar Erythema :

redness of thenar, hypothenar, distal ends of metacarpal bone, pulp of fingers with central pallor.

Causes:

- Pregenancy.
- Thyrotoxicosis.
- L.C.F.
- Estrogen containing contraceptive pills.
- Familial

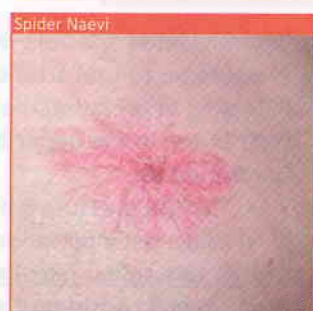


► Additional Items of General Examination in patient with liver disease :

1. Limbic examination.
2. Head and neck examination.
3. Sexual chr. Evaluation.
4. Systemic review (C.N.S. - Chest - C.V.S. - Kidney).

1. Limbic examination:

Upper limb	
Nails	• Koilonychia (Fe deficiency due to GIT bleeding). • Leuconychia (hypoalbuminaemia). • Muehrke's lines (hypoalbuminaemia). • Blue lunulae (Wilson's).
Hands	• Asterix: patient stretches out hands in policeman's stop position and fingers spread out (+ closed eye). • Palmer erythema. • Pallor of the creases. • Dupuytren's contracture: (fibrosis of the palm's fascia) (alcoholism, manual labor). • Palmer or tendon xanthomata.
Arms	• Scratch marks. • Spider naevi. • Bruising. • Xanthomata.
Lower Limb	
	• Oedema. • Bruising. • Neurological examination. • Xanthomata.



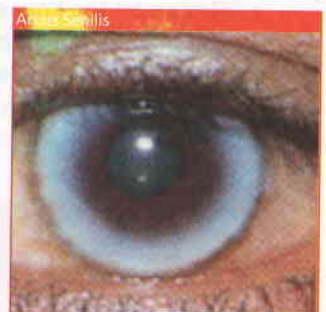
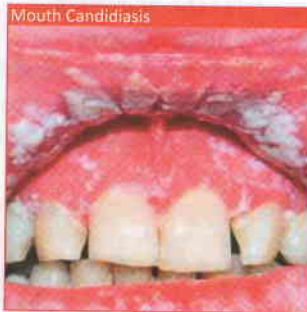
► N.B.

Enlarged lymph node due to:

Supraclavicular nodes (Virchow's node): lung or GIT malignancy.

2. Head and neck :

Eyes	• Cornea rings (Wilson's). • Sclera: jaundice. • Iritis: inflammatory bowel disease. • Xanthelesma.
Lips	• Telangiectasia. • Brown freckles (Peutz-Jaeghers).
Mouth	• Breath: fetor hepaticus - Ethanol (alcoholism). • Ulcer: (Crohn's, coeliac) - white candida patches - cracks at mouth edges. • Teeth: cavities (acid effect). • Gums: hypertrophy - bleeding - Gingivitis.
Tongue	• Leucoplakia: smoke, spirits, sepsis, syphilis, sore teeth. • Atrophic glossitis: hypovitaminosis - Plummer vinson. • Macroglossia : B12 deficiency.

**3. Sexual character evaluation:**

e.g. gynecomastia and testicular atrophy.

4. Systemic review:

	Cause	Result	Association
C.N.S.	Autoimmune PN (gastro paresis diabeticorum)	Hepatic encephalopathy	Hepatolenticular "Wilson's"
Chest	Cor-pulmonale → enlarged tender liver.	Amoebic liver abscess. Hydatid. Sympathetic effusion (Rt. PI). Hepato-pulmonary Syndrmome.	Alpha one anti trypsin deficiency
C.V.S.	Cardiac cirrhosis. S.B.E. = splenomegaly.	Bilharziasis. Cor-pulmonale.	
Renal		Hepato-renal. Pre-renal (acute GIT bleeding). Nephrotic (extra hepatic of HCV - B man-soni).	

► N.B.**Hepatopulmonary syndrome:**

In advanced LCF → Marked ↑ vaso dilator materials (VDM) → opening of pulmonary A-V shunt → Cyanosis, Hypoxia & Dyspnea.

On laying flat

→ ↑ venous return → shunt become inactive, so dyspnea improves but appears on standing (Platypnea)

LOCAL ABDOMINAL EXAMINATION

Inspection

General consideration:

- The patient must be exposed from the nipple to the symphysis pubis.
- The patient's hand should remain at his sides with head resting on a pillow.
- Flexion on the knees may relax the abdomen.
- The patient should have an empty bladder.
- Warm room and adequate light must be provided.
- For easy localization of any abnormalities it is useful to divide the abdomen in 4 quadrants or 9 segments
- Watch the patient's face for signs of discomfort during the examination.

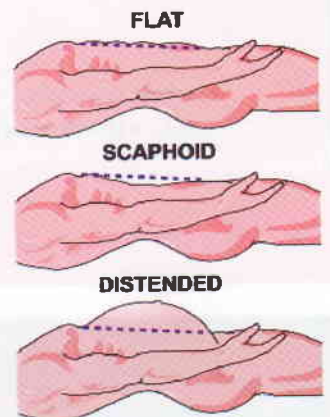
Inspection and confirmed by Some Palpation

Front (15) = Contour+7+7		Back (5)
Midline (7)	Sides (7)	
1. Subcostal angle. 2. Epigastric pulsation. 3. Visible peristalsis. 4. Divercation. 5. Umbilicus. 6. Hair distribution. 7. Genitalia.	1. Respiratory movement. 2. Breast. 3. Hernial orifices. 4. Pigmentation. 5. Veins. 6. Scratching marks. 7. Scars.	1. Scar. 2. Deformity. 3. Swelling of renal angle. 4. Cafe' au lait patches "neurofibroma". 5. Tuft of hair "spina bifida".

► Contour :

(must be the first step) can be best appreciated by standing at the foot of the table and looking up towards the patient's head.

- **Normal:** slightly scaphoid with preserved waist.
- **Abnormal:**
 - **Scaphoid:** the anterior abdominal wall is sunken and presents a concave in Cachectic patient.
 - **Bulging:**



Symmetrical (5 Fs)

- Fat = obesity (sunken umbilicus)
- Flatus = (gases)
- Foetus
- Fluid = ascites
- Full urinary bladder

Asymmetrical

- Organ swelling (HSM)
- Ovarian or uterine tumor
- (comment on mass)

Inspecting the abdomen (abdominal contour)



Distended abdomen with full flanks



Scaphoid



Inspection of the front (midline) (7) :**1. Subcostal angle**

- **Normal:** acute to right (70° - 90°).
- **Obtuse:** upper abdominal swelling (HSM) - ascites - barrel shaped chest.

2. Epigastric pulsation:

Place your hand longitudinal in the subcostal angle, Pulsation classified according to the direction into :

- **At the tip of fingers:** RV ++ , increased with deep inspiration.
- **From the right side:** **hepatic pulsation** (tricuspid stenosis - TR), liver is enlarged and tender during bimanual examination.
- **From behind:** **aortic pulsation** (thin - hyperdynamic - aneurysm), pulsating down to umbilicus.

3. Visible peristalsis.

- **Normal:** in thin person or in emaciated person.
- **Abnormal:**
 - **Pyloric obstruction:** slow waves from the left rib margin to the right. Exaggerated by massage, tapping or drinking soda + confirmed by Succussion splash (see auscultation).
 - **Intestinal obstruction:** called step ladder.

4. Divercation of recti :

- Separation of rectus abdominis muscles
- Ask the patient to raise his head up without support (lift head).
- Usually confirmed by palpating the defect between both recti.
- **Causes:**
 - chronic increase of the intra abdominal pressure (HSM - ascites) + hypoproteinemia.

5. Umbilicus (4 Ss + CD)

Site	• Normal: midway between symphysis pubis and xiphisternum. • Upper abdominal swelling and ascites slightly shift it downward, vise versa.
Shape	• Normal: Inverted. • Everted umbilicus means chronic increase of the intra-abdominal pressure (HSM – ascites).
Swelling	• Hernia: expansile impulses with cough. • Nodules: GIT of breast cancers (Sister Mary Joseph's nodule).
Skin lesions	• Scar. • Wound.
Colours	• Cullen's sign: intra-peritoneal bleeding - acute pancreatitis " • Causes of generalized pigmentation (see general ex VI).
Discharge	• Urine: patent urachus. • Faeces: colonic fistula. • Pus: Suppurative inflammation. • Bile: biliary fistula. • Fluid: ascities (bursting abdomen).

Examining Subcostal Angel



Palpating epigastric Pulsations



Checking Recti Divercation



Checking for impulse on cough

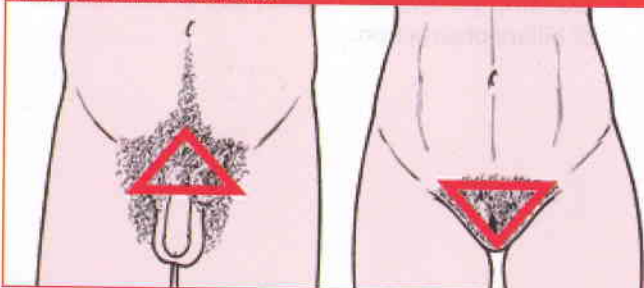
**6. Supra pubic hair distribution:**

- **Normal:** triangular in male with apex directed upward (umbilicus) & horizontal in females.
- **Abnormal:** as in
 - **L.C.F.:** feminine distribution.
 - **Hypogonadism:** loss of hair.

7. External genitalia

If the patient is circumcised - phimosis - para phimosis etc

supra pubic hair normal distribution



► Inspection of the front (sides) (7) :

1. **Respiratory movement (see lung disease)**

- Patient of tense ascites usually orthopnic and breath thoraco-abdominal.
- Patient of peritonitis usually has rigid dorsal decubitus and has absolutely thoracic breathing.

2. **Breast:** (one of the general examination items and must be examined in local abdominal examination).

- **Gynaecomastia:** hyperplasia of the glandular component of male breast. Confirmed by pinching test as a disc (button like). Usually presented as a one sign of L.C.F. or caused by spironolactone. Comment on: laterality - tender or not.
- **Breast atrophy** in females noticed in L.C.F.

3. **Hernial orifices:**

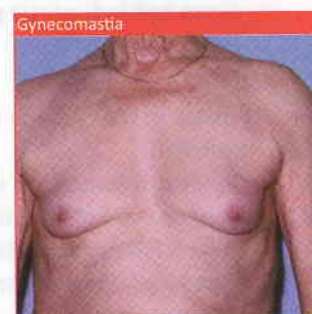
- Expansile impulses with cough.
- Preferred in standing patient.
- **Palpate the orifices defect:**
 1. **Epigastric:** small, midline through linea alba defect located between the xiphoid process and umbilicus.
 2. **Umbilical:** bulging defect at umbilicus.
 3. **Incisional:** defect in abdomen muscles after surgical incision. Must palpate the size of the defect.
 4. **Abdominal:** hernia through the abdominal wall.
 5. **Inguinal:** Direct or Indirect.

4. **Veins**Visible or dilated:

- **Visible:** straight, narrow and not raised.
- **Dilated:** Tortuous, wide and raised above the level of the skin.

If dilated:

Prominent, dilated veins may represent collateral circulation through the abdominal wall that has developed to compensate for obstruction of either the inferior vena cava or or portal vein.



Portal (caput medusa)	Systemic (IVC obstruction)
Central	Peripheral
By Milking test: Filling away from umbilicus	By Milking test: From down to up

5. **Pigmentations:**

- Bluish at umbilicus: Cullen's sign (bleeding in peritoneum).
- Bruises on flanks: Grey Turner's sign (retroperitoneal bleeding as pancreatitis).
- Jaundice: yellow skin – usually due to liver disease or biliary obstruction.



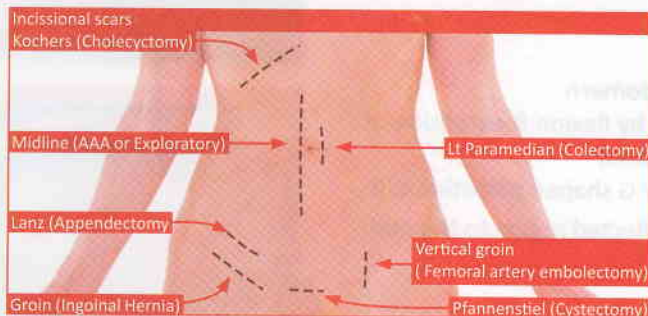
6. Scratch marking:

Denotes pruritus usually with obstructive jaundice

- Multiple, parallel and superficial.
- In accessible area.

7. Scars:

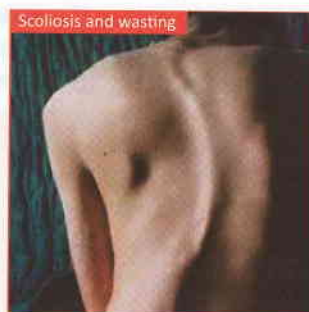
- Surgical (name - healing).
- Traumatic.
- Cautery.

**inspection of the back (5) :**

1. Scar.
2. Deformity.
3. Swelling of renal angle. (see later)
4. Cafe' au lait patches (neurofibroma).
5. Tuft of hair "spina bifida".

► N.B.**Add for inspection in all views**

- Scar:
- Surgical (name - healing).
- Traumatic.
- Cautery.
- Striae.
- Scratch marking.
- S.C. bleeding.
- Pigmentation.
- Elasticity (dehydration).
- Oedema.

**Palpation****General rules:**

- Let your patient lay on bed comfortably.
- Ask him or her to expose from above nipple to mid thigh (it's accepted to cover genitalia and breasts (in females) until it's needed to be examined).
- Ask the patient to bend his knee.
- Warm your hands.
- Ask patient if any part is tender: examine that last.
- Abdominal muscles must be relaxed by patient knee flexion.
- Superficial palpation then deep palpation.

Normal palpable structures:

- Sigmoid colon: left lower quadrant - firm, narrow tube.
- Cecum and ascending colon: right lower quadrant - a softer, wider tube.
- Pulsation's of ascending aorta: midline in upper abdomen.

Types of Palpation:

- **Superficial palpation**
- **Deep Palpation which have many methods:**
 - Ordinary method
 - Enforced
 - Bimanual
 - Ballotment
 - Dipping
 - Rolling
- **Per Rectal (PR)**
- **Per Vaginal (PV)**

Less commonly palpable, but normal:

- Liver: just below right costal margin (soft).
- Transverse and descending colon.
- Lower pole of the right kidney: (very deep, mostly in thin women).
- Iliac artery: pulsation's - left lower quadrant and right lower quadrant.

► **Superficial palpation :****Aim:**

- Gain patient's confidence
- Detect tenderness, hyperesthesia, temperature, guarding & rigidity.
- Detect superficial swellings e.g lipoma, varicosities & hernia:
Ask the patient to contract the abdominal wall muscles by raising the head (differentiate between intra & extra-abdominal swelling and notice the swelling mobility with respiration).
- To prepare the patient for deep palpation

Method:

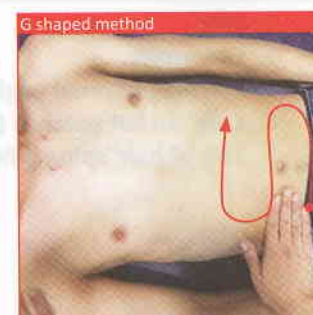
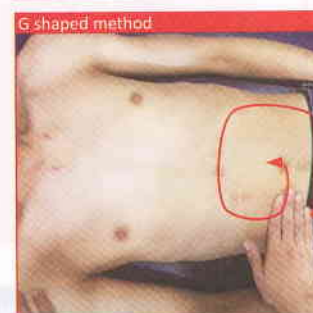
- Place your extending hand flat on the patient's abdomen
- Gently press (1CM depth) the patient's abdomen by flexion & extension of the metacarpal joints of fingers (light dipping method)
- slowly progress around the 9 regions either in S or G shaped palpation & if the patient complains of abdominal pain let the affected region to the end

Finding:**Assessment of muscle tone:**

There are 3 reactions that indicate pathology:

- **Guarding:** muscles contract as pressure is applied.
- **Rigidity:** rigid abdominal wall indicates peritoneal inflammation.
- **Rebound tenderness:** release of pressure causes pain.

	Guarding	Rigidity
Mechanism	Voluntary contraction of anterior abdominal wall	involuntary contraction of anterior abdominal wall
Respiration	Disappears on inspiration	present with inspiration
Movement with respiration	Freely mobile	Limited
e.g.	During painful palpation	Peritonitis

**Examination of patient with guarding (Nickson's technique):**

Make a fist by your lt. hand and press by it on the sternum, while examining abdomen by rt. hand; this will limit the chest muscles of respiration allowing the abdominal muscles to move which will release the guarding.

► N.B.

If the patient is frightened, initially use the patient's hand under yours as you palpate. When patient calms then use your hands to palpate. The most sensitive indicator of tenderness is the patient's **facial expression**.

► **Deep palpation :****Aim:**

- Localize abdominal organs
- localize abdominal masses

Method:

- Each organ has a special method for palpation, see below...

Finding:

- Describing the mass as the following:
 - edge
 - consistency
 - moves with respiration or not
 - tenderness
 - pulsations
- Intral or extra abdominal
- site
- size
- shape

Palpation of Liver

Surface anatomy of the Liver:

The liver can essentially be visualised as a triangle, with its upper margin below the nipples on either side of the chest, and the lower margin making a line from just above the tenth rib on the right side to below the nipple on the left side.

The superior surface of the liver lies just below the diaphragm; this means that the lower margin of the liver will move downwards on inspiration, and this can be palpated. As the liver is also a very dense organ, it is very dull to percussion and you can easily percuss out the borders of the liver if palpation is unsuccessful. The gallbladder area can be palpated around the tip of the right ninth rib. The normal gallbladder is impalpable; it only becomes palpable when distended with stones or bile, and the area will become very tender if there is inflammation present.

Liver Span

- liver span of Rt lobe around 8: 12 cm in adult.
- Lt lobe span 4: 8 cm in adult but its ultrasonographic finding

► Liver Palpation :

- **Mark the upper border 1st by tidal percussion .**
- **The lower border by:**
 1. Ordinary technique.
 2. Bimanual.
 3. Hooking.
 4. Dipping.
 5. Tip of hands (Hutchinson's method).
 6. Auscultatory method (Macleod).

1. Ordinary technique:

- **Right lobe** at MCL beginning from right iliac region.
 - **Left lobe** at midline from umbilical region.
- Ask the patient to take a deep breath. By radial aspect of the index or tip of fingers, Feel the edge of the liver press against your fingers. Or, it may slide under your hand as the patient exhales.

2. Bimanual:

As ordinary with the **left hand placed just below the right costal margin.**

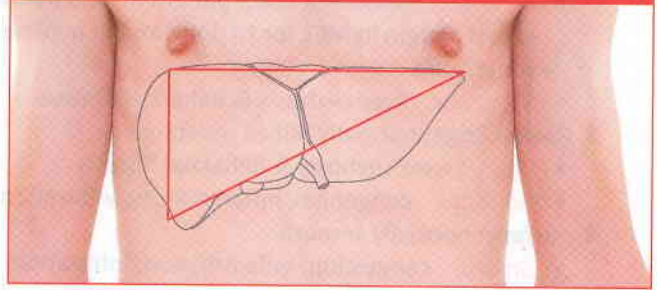
3. Hooking method:

- Stand by the patient's chest.
- (Hook) your fingers just below the costal margin and press firmly.
- Ask the patient to take a deep breath.
- You may feel the edge of the liver press against your fingers.

4. **Dipping:** (for palpation of organs in tense ascites)
Flex MCP joint fast to displace fluid and palpate a mass or enforced by both hands.

Disadvantage: The organ descriptive details are impossible

surface anatomy of the liver



Borders:

Upper border	Lower border
• Lt - MCL 5th intercostal space. • Rt - MCL 5th rib. • Rt - MAL 7th rib. • Rt - scapular 9th rib.	• Lt - MCL 5th intercostal space. • Lt 8th costal cartilage. • Midway between the xiphisternum & umbilicus. • Rh 9th costal cartilage. • Rt - MCL 1 inch below the costal margin. • Rt - MAL 11th rib.

Bimanual Liver Palpation



Ordinary Liver Palpation



Hooking method



Ordinary method



Enforced method



Dipping method



Comment on following items:

1. **Site:** in right hypochondrium
2. **Size:** normally not felt below costal margin
 - **Enlarged:** measure it using patient fingers below costal margin in MCL for Rt. lobe and in midline for Lt. lobe
 - **Shrunk:** liver cirrhosis & Bilharzial fibrosis
3. **Border Edge:** normally felt as resistance
 - **Sharp:** liver cirrhosis & Bilharzial fibrosis
 - **Rounded:** congenital, inflammatory, infiltration
4. **Surface:** normally smooth
 - **Smooth:** congestion, inflammation, infiltration, cirrhosis
 - **Irregular:** liver cirrhosis if macro-nodular
 - **Nodular:** malignancy
5. **Consistency:** normally soft
 - **Soft & enlarged:** congenital, inflammation & infiltration
 - **Firm:** Bilharziasis
 - **Hard:** malignancy
 - **Cystic:** amebic abscess & hydatid cyst
6. **Tenderness:** Test to examine tenderness: fist test in non palpable live Congestion, inflammation & malignancy
7. **Pulsation:** TR, TS, hemangioma
 - Examination for pulsation by bimanual examination: put one hand on the liver anteriorly and the other hand at the back, ask the patient to hold his breath and feel for pulsation.

► Example:

Intraabdominal swelling, moves up & down with respiration, in Rt. hypochondrium, 3 fingers below costal margin, not tender, not pulsating, sharp edge, firm in consistency, smooth surface, mostly it's Rt lobe of liver

► Causes of hepatomegaly :**Infectious:**

- Leptospirosis
- Pyogenic cholangitis
- Pyelophlebitis
- Portal pyemia
- Amebic hepatitis
- Toxoplasmosis
- Viral hepatitis
- Herpes simplex

Metabolic:

- Wilson's disease
- Hemochromatosis
- Fatty liver e.g. Reye's, DM
- Lipid storage disease
- Glycogen storage disease
- (Von Geirkes)
- Blood:**
- Megaloblastic anemia

Circulatory:

- Chronic venous congestion
- Congestive heart failure
- Pericardial effusion
- Constrictive pericarditis
- Conginital:**
- Riedel's lobe
- Polycystic disease

Tumors:

- CMV
- Metastasis
- Hepatoma
- Cholangioma

Palpation of Spleen**Surface anatomy of the spleen:**

Site: left hypochondrium

Under 9th, 10th & 11th ribs (long axis on 10th rib).

Medially: scapular line.

Laterally: MAL.

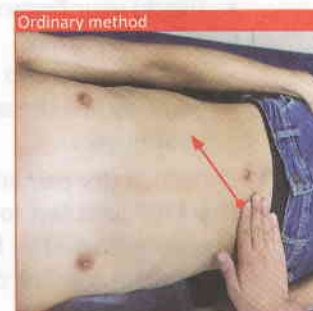
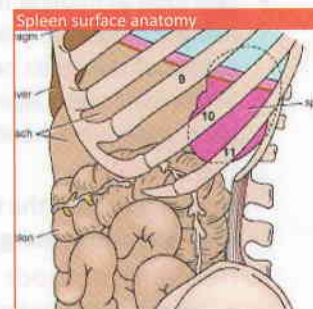
► Spleen Palpation :

1. Ordinary technique.
2. Bimanual.
3. Hooking.
4. Dipping.
5. Tip of hands (Hutchinson's method).

1. Ordinary technique:

Place your right hand flat on the right iliac fossa and direct your hand towards the left costal margin & feel the edge of enlarged spleen during the peak of inspiration (or ask the patient to take deep breath in) in one of the following position:

- Radial side of index finger: parallel to the left costal margin
- Tips of fingers (middle three fingertips): perpendicular to the left costal margin



2. Bimanual:

As ordinary with the **left hand placed just below the Left costal margin**. If not felt do the same method in Rt. lateral position

3. Hooking method:

- Stand by the patient's chest on the **Lt. side**.
- (Hook) your fingers just below the costal margin and press firmly.
- Ask the patient to take a deep breath.
- You may feel the edge of the spleen press against your fingers.

4. Dipping: (for palpation of organs in tense ascites)
Flex MCP joint fast to displace fluid and palpate a mass or enforced by both hands.

Disadvantage: The organ descriptive details are impossible

Bimanual method



Hooking method



Dipping method



Enforced method

**Comment on the following items:**

- 1. Site:** in left hypochondrium
- 2. Size:** normally Not felt below costal margin : normally or impalpable spleen
 - **Palpated:** enlarged at least 3 times if enlarged & doesn't cross the midline (or umbilicus): count by patient's finger breadth
 - **crossed midline** : huge spleen
- 3. Border Edge:**
 - in bilharziasis has a rounded anterior edge with one or multiple notch
- 4. Surface:** in bilharziasis smooth
- 5. Consistency:**
 - **Soft & enlarged** : in endocarditis, Malaria & septicemia

6. Tenderness:

In inflammation : typhoid & Brucellosis, TB (miliary), SBE, infarction

7. Pulsation: splenic arterio-venous fistula**8. Pitting sign** = Mofti's sign:

- in chronic myeloid leukemia
- Press on the surface of spleen by your thumb for a while then release the pressure, if you found an indentation, so it's positive

9. Notch in the antro-medial border

- Embryologically, the spleen is formed by fusion of splenules. The notch is formed at the site of their fusion

► Example:

Intra-abdominal swelling moves up & down with respiration, oblong in shape in left hypochondrium extending to: Felt cm (or finger breadth) below left costal margin in left mid clavicular line or Huge i.e. crossing midline, Not warm, not tender, not pulsatile, Firm in consistency, sharp anterior border with smooth surface. Hand can't reach the upper pole as you can't insinuate fingers between costal margin

► Causes of Splenomegaly :**Infectious:**

- Paratyphoid
- Typhus
- TB
- Anthrax
- Chronic malaria
- Psittacosis

Blood:

- Thrombocytopenia
- Thalassemia major

Circulatory:

- Portal vein occlusion:
- Tumour
- Thrombophlebitis

Conginital:

- Cysts of spleen

Metabolic:

- Gaucher's disease
- Porphyria
- Rickets

Tumors:

- Lymphangioma
- Fibrosarcoma
- Waldenstrom
- macroglobulinemia

► **Causes of HepatoSplenomegaly :****Infectious:**

- Typhoid
- Brucellosis
- Syphilis
- abscess
- Bilharziasis
- Hydatid cyst
- Kala azar
- Infectious mononucleosis

Blood:

- Chronic myeloid leukemia
- Hemolytic anemias
- Polycythemia rubra vera (PRV)
- Myelofibrosis

Circulatory:

- Portal hypertension

Colagen disease:

- Felty's syndrome
- Still's disease
- Sarcoidosis

Metabolic:

- Amyloidosis

Tumors:

- Hemangioma
- Malignant lymphoma

► **Impotant notes on liver & spleen :****Causes of tender splenomegaly: TIBS**

- Typhoid, typhus, TB (military)
- Infective endocarditis, Infectious mononucleosis, Infarction
- Brucellosis
- Septicemia

Causes of huge splenomegaly: spleen which crosses the midline:

- Portal hypertension (bilharziasis)
- Thalassemia major
- Chronic myeloid leukemia
- Chronic malaria
- Myeloproliferative disorders (Polycythaemia rubra vera & Myelofibrosis)
- Kala azar
- Gaucher's disease
- Splenic sarcoma

Why does enlarged spleen descend obliquely towards the umbilicus?

Towards right iliac fossa : due to presence of phrenicocolic ligament & it's axis.

Spleen may be found enlarged in Lt. iliac fossa in the following cases:

- Absent phrenicocolic ligament (embryological)
- Resection: hemicolectomy
- Infiltration of phrenicocolic ligament by malignancy
- Weak ligament: visceroptosis
- Huge spleen

What are the causes of palpable liver without hepatomegaly ?

Emphysema, subphrenic abscess

Causes of enlarged tender liver:

- Malignancy
- Infection: amebic hepatitis & abscess, viral hepatitis, pyogenic abscess
- Congestion: heart failure, constrictive pericarditis

Causes of nodular liver:

- Bilharzial with coarse nodularity
- Post necrotic cirrhosis (post hepatitis)
- Malignancy
- Syphilis Gumma (heparlobatum)
- Hydatid disease

Causes of absent splenic notch:

Congenital, infarction, adhesions, tumors.

Causes of multiple splenic notch:

Congenital, multiple infarction of the spleen

Stages of Bilharziasis:

Stage 1: Hepatomegaly

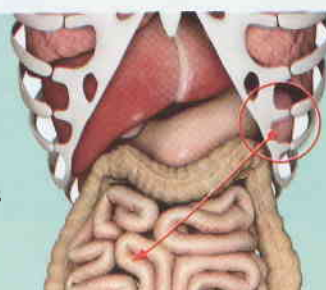
Stage 2: Hepatosplenomegaly

Stage 3: shrunken liver & splenomegaly

Stage 4: Shrunken liver, splenomegaly & ascites



My name is **Spleen**, and I enlarges that way (towards Rt. iliac) , because that guy named **Phrenicocolic ligment** prevents me from desending to the Lt. iliac fossa. You know what, If some one killed that bad boy, I would enlarges in the Lt. iliac fossa...



Palpation of Kidney

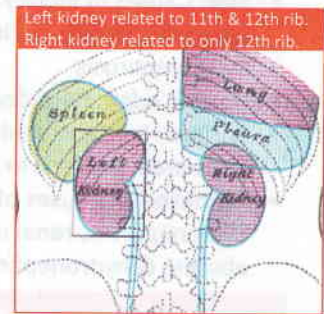
Surface anatomy of the kidney:

posteriorly the upper edge of Rt. kidney opposite the 11th dorsal spine and the lower edge of the 11th rib. Its lower edge is opposite the upper edges of L3 spine and vertebral body and about 4 cm. The left kidney is usually 1.25 cm higher, but being a little longer than the right, its lower limit may not be quite that much higher. The kidney is slightly lower in women and children than in men. The inner border reaches 10 cm. and the hilum 4 to 5 cm.

Renal Angle: Angle between last rib and lateral border of sacrospinalis muscle

Loin: lies between last rib and iliac crest and from vertebral column to flank

Flank: lateral aspect of loin



► Renal angle examination :

	Normally	Abnormally
Inspection	Skin: Normal	Skin: Ulcers, scars
	Shape :concave (Empty)	Shape: Fullness: swelling within renal capsule Bulge: swelling outside renal capsule
Palpation	No swelling	Swelling
	No tenderness	Tenderness: Thumb pressure test Costo-vertebral percussion Murphy's kidney punch
Percussion	Resonant	Dullness
Ausultation	Nothing	Bruit maybe heard in case of renal artery stenosis (Can be heard commonly anteriorly at transpyloric plane)

Thumb Pressure Test



Murphy's kidney punch



► Kidney Palpation :

Bimanual method:

Rt. Kidney:

The Right hand is placed anteriorly in the Right lumbar region while the Left hand is placed posteriorly in the right loin

Lt. Kidney:

The Left hand is placed anteriorly in the left lumbar region while the Right hand is placed posteriorly in the left loin.

Ballotement for examination of renal mass:

at the same previous position, push by the anterior hand and feel by the posterior hand (posterior ballotement) or push by the posterior and feel by the anterior (anterior ballotement)

Additional methods:

Thumb pressure test: apply pressure with the thumb to Costovertebral angle

Costovertebral percussion: using ulnar aspect of the hand strike the patient flank.

Murphy's kidney punch:

While the patient is sitting, examine for tenderness in the renal angle by using the ulnar border of the right hand (making a fist) percuss over the dorsum of the left hand placed on the renal angle; with comparing both sides.

It may help distinction between renal tenderness or tender abdominal wall or muscles of the back

Palpation of Rt. Kidney



Palpation of Lt Kidney



Comment on following items:

- **Site:** In lumbar region
- **Size:** Causes of kidney swellings : hypernephroma, polycystic kidney, perinephric abscess & hydronephrosis
- **Border, edge:** Rounded
- **Surface:** bossy, irregular in malignancy
- **Consistency:** Cystic in polycystic kidney
- **Tenderness:** Causes of tender renal swellings: Pyelonephritis, renal infarction , perinephric abscess & hydronephrosis

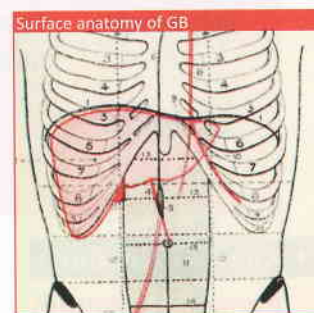
► N.B.:

Normal kidney may be palpable in: very thin persons

	Kidney	Spleen
Notch	No	Yes
Anterior & Posterior Ballotement	Ballotable (anterior & posterior)	Non ballotable Anterior only
Anterior	I can insinuate my hand between the swelling & the costal margin & I can reach the upper border	It is difficult to insinuate my hand between the swelling & the costal margin & if so I can't reach the upper border
Posterior	Can be pushed to renal angle	Can't be pushed to renal angle
Percussion	Band of resonance	Dull all through
Surface	Bossy	Smooth
Edge	Rounded	Sharp

Palpation of Gall Bladder**Anatomy**

- **Shape:** pyriform-shaped.
- **Size:** 8 - 12 cm length X 3 cm width.
- **Site:** fossa for gall bladder on the inferior surface of the right lobe of the liver.
- **Capacity:** 30 - 50 ml.
- **Power of concentration:** 10 times.
- **Parts:** funds, body and neck.



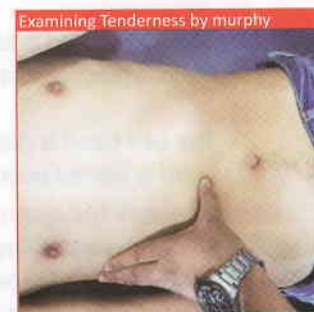
Normally GB cannot be felt, felt only if enlarged

Examination of GB is palpated for swelling& tenderness**1. Tenderness:**

Murphy's sign acute cholecystitis:

Compress your right fingertips below the right costal margin at the site of the GB & ask the patient to take deep inspiration & observe his face & breathing:

- Continue breathing: normal
- Pain & can't continue inspiration: cholecystitis

**2. Swelling:**

Site: Rt. hypochondrium

Method: Single handed method by deep palpation as liver

Comment on gall bladder swelling:

Intra-abdominal, moves up & down with respiration, in Rt. hypochondrium, pyriform or rounded, cystic or hard mass (hard in malignancy)

Painless swelling of gall bladder:

- Tumors of GB
- Cancer head of pancreas
- Courvoisier's sign: Palpable distended gall bladder in pancreatic cancer

Painfull swelling of gall bladder:

- Cystic duct stone: mucocele, pyocele
- torsion
- pericholecystic abscess

DD: Riedel's lobe (accessory hepatic lobe)

Palpation of Urinary Bladder

Normally UB is not palpable, felt only in retention.

Site: middle line, never cross umbilicus

Method:

Deep palpation from the umbilicus downwards by tips of fingers or by radial aspect of index finger of left hand

Comment distended UB "retention of urine":

Pelvi-abdominal swelling i.e. Has no lower border

Oval in shape, smooth, firm, regular.

Direct pressure on it produces a desire to micturate, Immobile, in suprapubic region, Positive fluid thrill, Dull on percussion

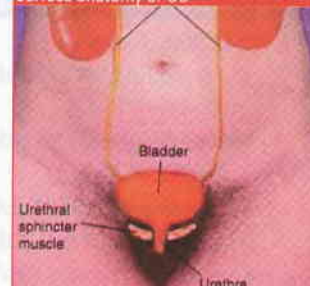
Differential Diagnosis:

- Gravid uterus
- Ovarian cyst
- Any uterine mass e.g.-mesenteric cyst

Palpating UB



Surface anatomy of UB



Palpation of Colon

Method:

Method: Using both hands on each other (feel by the dominant hand and press by the non dominant hand) rolling method in perpendicular directions (Horizontal & Vertical)

Cecum:

Site rolling technique in right iliac fossa

Normally Cecum may be felt

Characters of Cecum:

Soft, rounded swelling with indistinct borders

Differential diagnosis: Tumors of Cecum

Sigmoid:

Site: rolling technique in left iliac fossa

Normally the pelvic colon may be palpable in thin patient or irritable bowel syndrome (spastic colon)

Characters of pelvic colon:

Oblong sausage-shaped (about 12 cm length)

Does not move with respiration, parallel to the inguinal ligament

Movable from side to side (but not vertically)

Gurgling sensation on pressure

Differential Diagnosis; mass in left iliac fossa:

Commonest in children iliac adenitis

Commonest in middle age : Bilharzial pericolic mass

Commonest in old age: cancer colon

Palpating Cecum



Palpating sigmoid



Palpation of the Abdominal Masses

► Palpation of the Bilharzial pericolic mass :

Site: Lt. iliac fossa

Method: rolling technique

Characters:

Moves from side to side but not up down, Oval in shape, Firm & may be tender.

Pathogenesis:

heavy deposition of ova in the subserous area → Bilharzial reaction → large subserous mass (pericolic mass)

If deposition of ova submucous Bilharzial reaction intestinal polypi

Clinically the mass can't be felt by per-rectal examination

No need for excision of the mass because: It is not precancerous & does not cause obstruction

Significance: Associated with bilharzial polyposis:

DD: mass in left iliac fossa

► Palpation of Para Aortic Lymph node :

Method: Rolling technique

Site: umbilical & epigastric regions along lateral border of aorta i.e. on the left of a line extending from xiphisternum to umbilicus

Comment on: site, size, shape,

Significance: if felt in malignant cases, signifies preoperative inoperability

► Palpation of abdominal aorta :

Technique: by deep palpation using two handed method to the midline above & lateral to umbilicus.

Significance: Aortic anurysm

► Per Rectal Examination (PR) :

Patient position: left lateral position (best), Knee-elbow position

Inspection: separate buttocks carefully inspect perianal area and anus for:

- Pruritis ani (signs of External piles or fistula or inflammation)
- Anal warts, fissure
- External Haemorrhoids

Palpation:

- Put a lubricant on gloved index finger of Right hand
- Ask patient to relax & introduce your finger gently & Rotate finger 360° in anal canal searching for:
 - Thickening or irregularity in wall
 - Tone of anal musculature & sphincters
- Then pass finger into rectum with left hand placed on patient Right hip & latter in suprapubic position
- On withdrawing finger look at it for blood, mucous, pus

► N.B.: Palpation of the ascites:

Transmitted thrill (fluid thrill) in tense ascites see ascites

Value of PR:

- **Sphincter:** Loss of tone and patulous. (Cauda equina syndrome).
- **Contents:** Hard impacted stools, Foreign body.
- **Rectal wall:** Pelvic masses (Ovary, Uterus) in women.
- **Mucous membrane:** Irregular, Mass. (Cancer), piles (complicated).
- **Prostate in men:**
 - Smooth, large, firm and non-tender. (Benign enlargement)
 - Hard, irregular nodule or fixed hard mass. (Cancer, Stone, Chronic prostatitis).
 - Large, boggy and tender. (Acute Prostatitis).
- **Stools:**
 - Bloody: (Hemorrhoids, Bleeding rectal lesion).
 - Black: (Upper GI bleed, Iron, Some Antacids).



It's not funny at all. **PR** in internal medicine is **not Public Relationship**; it's **Per Rectal** examination dear...



Percussion

Simple roles:

- The percussing finger: middle finger of the right hand.
- The movement: from the wrist joint.
- The percussed finger: middle finger of the left hand

Abdominal percussion:

1. Ascites.
2. Liver borders: liver span.
3. Spleen: for splenomegaly.
4. Kidneys.
5. Bladder: for enlarged bladder or pelvic mass.
6. Masses.

► **Percussion For Ascites :**

Severe or tense	Moderate	Mild
Transmitted thrill	Shifting dullness	Knee elbow position
> 3000	1500 - 3000	50 - 1500

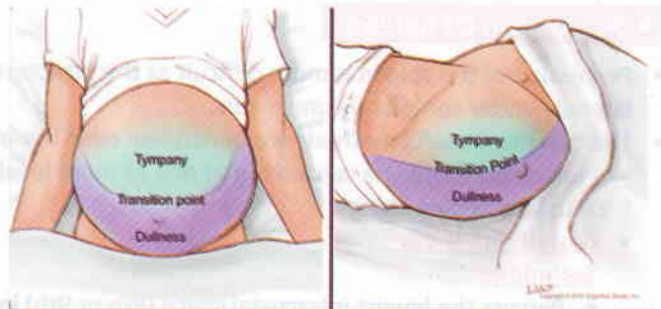
Technique:First step:

- Direct percussion is done over the abdomen, from the umbilicus to the flanks.
- The location of transition from tympany to dullness is noted.

Usually in ascites:

percussion note is tympanitic over the umbilicus and dull over the lateral abdomen and flank areas (**U shape dullness**).

The tympany over the umbilicus occurs in mild or moderate ascites, because bowel floats to the top of the abdominal fluid.

Shifting dullness:

- Percuss from the midline to the flanks on both sides:
Place the finger parallel to the expected edge. Percuss from resonance in the mid-abdomen to dullness in the flanks.
- The patient rolled to the opposite side and wait for 30 seconds.
- The previous area of dullness should now be resonant.
- It does not matter which side one chooses to start with.

If the percussion of all abdomen is dull and no tympany, use transmitted thrill to examine ascites...

Transmitted thrill (fluid thrill)

- Place one hand on the patient flanks.
- With the other hand briskly tap the other flank.
- A third hand (Patient hand) is placed in the mid-abdomen with sufficient pressure applied to dampen any wave that may pass through the anterior abdominal wall.
- **Positive test:** a shock wave be felt with palpating hand.

If the percussion of the abdomen is resonant all over the abdomen and failed to detect minimal ascites use the following technique:

Knee elbow position

Place the patient in knee elbow position and percuss the umbilicus area.



► **Percussion Of Liver :**

Aim: For detection of the liver span

Liver span:

The distance between both upper and lower borders of the liver in the right MCL.
About **8 - 12 cm in a normal adult.**

The upper border (heavy percussion):

- Percuss downward from the chest in the right mid clavicular line until you detect the top edge of liver dullness. (See cardiology)
- The upper border of the liver is normally in the right 5th intercostal space.

The lower border:

- By **palpation** (see before)
- **light percussion:** Percuss upward from the abdomen in the same line until you detect the bottom edge of liver dullness.
- An alternate method of estimating liver size is the **scratch test:** Put the diaphragm of stethoscope just below Rt. Costal margin in MCL, by a sharp object scratch from the Rt. iliac fossa upwards till you hear the sound way much loader.

Light percussion of lower border of liver



Scratch Test for lower border of liver



Scratch Test for lower border of spleen

► **Percussion Of Spleen :**

- Percussion of the spleen is more difficult as this structure is smaller and lies quite laterally under completely under ribs.
- The two most useful methods are percussion over Traub's area and Castell's sign.
- Percussion should be carried out at one or more levels of Traub's area from medial to lateral (See Chest)
- **Castell's method:**

Technique:

- Percuss the lowest intercostal space (8th or 9th) in the left anterior axillary line. With the patient in full inspiration and then full expiration.
- **Positive sign:** if the note changed from resonant on full expiration to dull on full expiration.
- **Explanation:** (when the patient inspires, the spleen moves inferiorly along the posterolateral abdominal wall. If the spleen is enlarged enough that the inferior pole reaches the 8th or 9th intercostal space).

► **Percussion Of Urinary Bladder :**

- Percuss the upper border of the urinary bladder (Just above symphysis pubis)
- In 3 longitudinal lines (the midline and 2 para-median lines).
- The upper border of the urinary bladder (or any pelvic swelling) noticed as convex (n shape) line.

Percussion of Urinary bladder



Auscultation

Auscultation of the abdomen has a relatively minor role and used for:

1. Intestinal sounds.
2. Vascular sounds.
3. Scratch test.
4. Succussion splash.
5. Buddle sign.
6. Friction rubs.

Abdominal Auscultation



1. Intestinal sounds:

The diaphragm of the stethoscope should be placed on the abdomen, as least initially in the right lower quadrant near the ileocecal valve. Specifically listen for the pitch & frequency of the bowel sounds.

- **Normal:** gurgling, 5 - 35 per minute.
- **Rushing (Borborygmi):** loud and easily audible - normal in diarrhea.
- **Tinkling:** high pitched, (raindrops in a barrel): **intestinal obstruction**.
- **Decrease sounds:** (none for a minute) decrease gut activity. After abdominal surgery, abdominal infection (peritonitis) or injury.
- **Absent sounds:** no sounds for 3 minutes: ileus.

2. Vascular sound:

	Arterial bruits	Venous hum
Timing	Only during systole	Continuous
By	Diaphragm	Bell
Characterized by	High - pitched	Low - pitched
Increased by	---	Inspiration

- **Venous hum:**

Best heard overlying the portal vein in an area approximated by an elliptical shape between the umbilicus and the mid-clavicular line where it crosses the right subcostal margin.

- **Arterial bruits:**

Aorta	Begins at or just to the left of the xiphoid process and bifurcates at the level of the umbilicus.
Renal a.	Midway between the xiphoid process and the umbilicus and within 2 cm of the midline.
Bifurcation of CIA	Mid-way between the umbilicus and the mid inguinal point (MIP).
Femoral	Just above the inguinal ligament (MIP)

3. Scratch test:

Technique:

- Place the diaphragm over the area of liver/spleen
- Then scratch parallel to the costal margin until the sound intensity drops of marking the edge of the liver.
- Different patterns of scratch may be used (e.g. spokes of a wheel). see picture before

4. Succussion splash:

- Called auscultation of the stomach
- Detected in gastric outlet obstruction e.g. pyloric ulcer or neoplasm.
- **Technique:**
 - Place the stethoscope on the epigastrium.
 - Then shake both iliac crests.
 - While shaking, listen to splash from retained fluid.

► **N.B.:**

Blood flow through the aorta itself usually does not generate any appreciable sound.

5. Buddle sign:

- In knee elbow position.
- It is useful for detecting small amounts of ascites as small as 120 ml (shifting dullness and bulging flanks typically requires 500 ml).

6. Friction rubs (rare)

- Right and left upper quadrant.
- Grating sound with respiratory movement.
- Indicates inflammation of peritoneal surface of an organ.

► **N.B.:****Auscultation over the liver:**

- Friction rub (grating during breathing) peritonitis.
- Bruit (cancer).
- Scratch.

Auscultation is sometimes done before percussion and palpation, unlike in other examination.

It may be performed first because vigorously touching the abdomen may disturb the intestines, perhaps artificially altering their activity and thus the bowel sounds.

Additionally, it is least likely to be painful - invasive; if the person has peritonitis and you check for rebound tenderness and then want to auscultate you may no longer have a cooperative patient.

LONG ABDOMINAL CASE► **History :**

Personal history: Female patient, xxx, 47 years old, from Al-Fayoum, house wife, married 29 years ago and has 3 sons, the youngest is 19 years old, she has no special habits of medical importance.

Complaint: She is complaining of abdominal swelling of 2 weeks duration.

History of present illness:

The condition started 15 years ago by an active attack of haematemesis of sudden onset with 2 cups of dark brown blood preceded by nausea and followed by melena for 3 days, she admitted in Aldemerdash hospital, investigated by upper endoscopy & treated by endoscopic sclerotherapy without blood transfusion and this attack is not recurrent until now.

- No appetite changes, dysphagia, heart burn or halitosis.
- No changes in bowel habits or bleeding per rectum.
- 10 years ago, patient suffered from lower limbs oedema with gradual onset and progressive course, responds to diuretics.
- Followed after 2 years by ascites with gradual onset and progressive course with several paracentesis process of about 3 liters of clear fluid and not followed by any complications.
- Lower limb oedema & ascites are associated with jaundice and pruritis with dark urine and low grade fever & progressive mild loss of weight.
- No abdominal pain or urinary symptoms.
- No gynaecological symptoms.
- No symptoms of other system affection.
- Patient is investigated by CBC, liver function tests and abdominal ultrasonography then treated by vitamins & diuretics.

Past history:

History of bilharziasis at age of 13, manifested by dysentery, investigated by urine & stool analysis and treated by praziquantil.

No history of other chronic diseases, surgical operations or drug intake.

Family history: Irrelevant.

► **General Examination :**

- Patient with an average general condition, average built.
- Patient is fully conscious, oriented for time, place and persons
- Patient lies in semi sitting position.

Head and face examination:

- Orange yellow jaundice, wasted temporalis, with endemic parotitis.
- No pallor or cyanosis.
- No puffy eyelids with normal eye brows.
- Bad oral hygiene with normal tongue size.

Neck examination:

- Congested pulsating neck veins, JVP = 4 cm above sternal angle with normal waves.
- Palpable carotid pulsation without thrill.
- Central trachea - no lymph node enlargement or thyroid swelling.
- Spider nevus in root of the neck.

Upper limb examination:

- Pulse: 75 beats / minute, regular, big volume,
- Blood pressure: 130 / 50 mmHg.
- Palmar erythema: are present in both hands.

Lower limbs examination:

- Shows bilateral, painless, pitting oedema.
- Echymotic patches: are present in lower limbs, upper limbs and trunk.
- Systems examination: no abnormalities were detected are regard C.V.S., chest & C.N.S. examination.

► **Local Examination :****Inspection:**

- Symmetrical enlargement of the abdomen with full flanks, wide subcostal angle, and abdomen moves freely with respiration.
- No gynecomastia, epigastric pulsation.
- There are divercation of recti, umbilicus is shifted downward, everted with umbilical hernia, no pigmentation, discharge or nodules.
- No striae, scar or hernia neither dilated veins.
- No swelling in renal angle or back deformity.

Palpation:**A. Superficial**

No superficial swelling or tenderness.

B. Deep palpation

- Right & lower lobes of liver are not palpable.
- Spleen: swelling in the left hypochondrium intra-abdominal, 5 fingers below the left costal margin with notch, sharp edge firm in consistency, smooth surface, not tender & not pulsating.
- Kidney are not palpable.
- No any palpable mass.

Percussion:

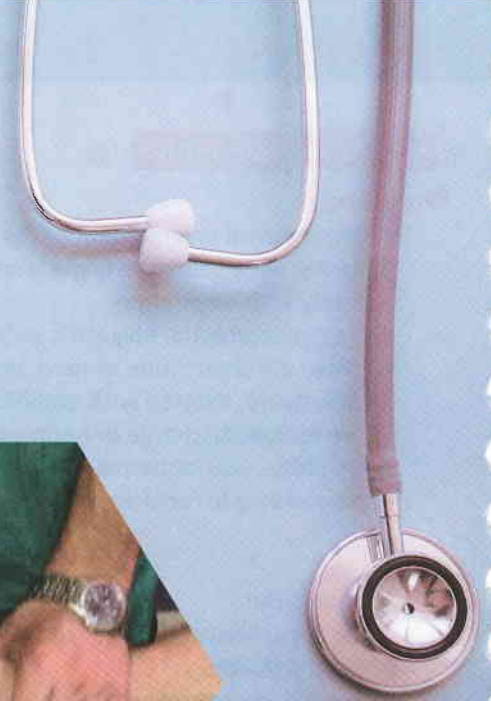
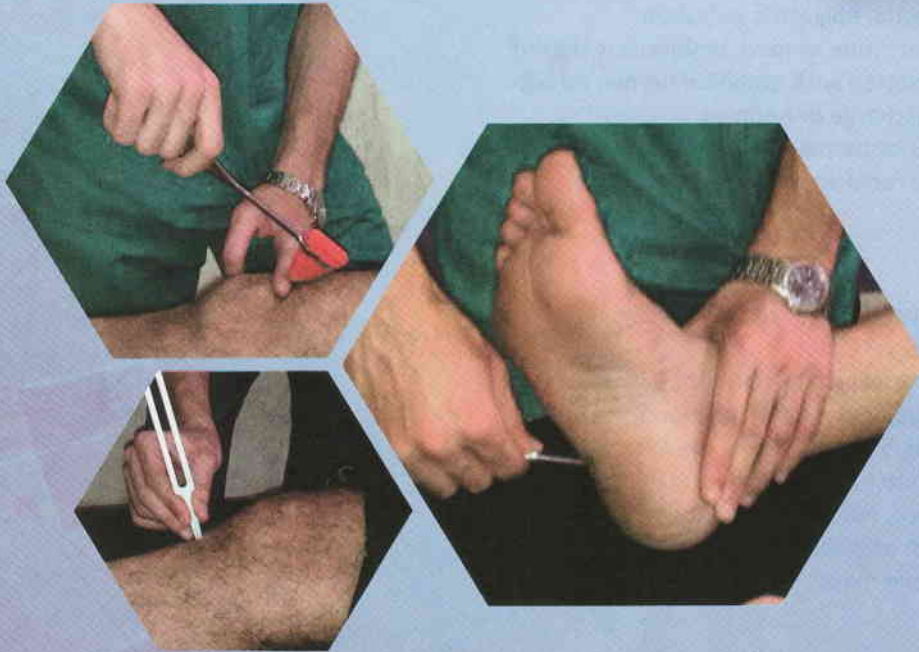
- Moderate ascites is detected by shifting dullness.
- Dullness on Traub's area.

Auscultation:

- Normal intestinal sounds.
- No vascular sounds, rubs or splachs.

► **Proper Diagnosis :**

A case of shrunked liver with splenomegaly for D.D. most probably due to mixed bilharzial & hepatitis cirrhosis, with vascular and cellular decompensation.



NEUROLOGY

||

Rare presentations of common diseases are much more common than common presentations of rare diseases.

||

INTRODUCTION

► **Classifications of Nervous System:****A- Functional classification (Neurophysiology):**

- 1- Motor
- 2- Sensory
- 3- Psychological

B- Structural classification (Neuroanatomy):

- 1- Central Nervous System (CNS)
- 2- Peripheral Nervous System (PNS)

► **Central Nervous System (CNS):****Brain:**

- 1- Cerebrum
- 2- Cerebellum
- 3- Brain Stem: Midbrain, Pons & Medulla oblongata
- 4- Diencephalon

Spinal Cord (31 Segments):

- 8 Cervical
- 12 Thoracic
- 5 Lumbar
- 5 Sacral
- 1 Coxygeal

► **N.B.**

Conus: last 3 segments of spinal cord.

Epiconus: 4 segments above conus.

► **Peripheral Nervous System (PNS):****Cranial nerves**

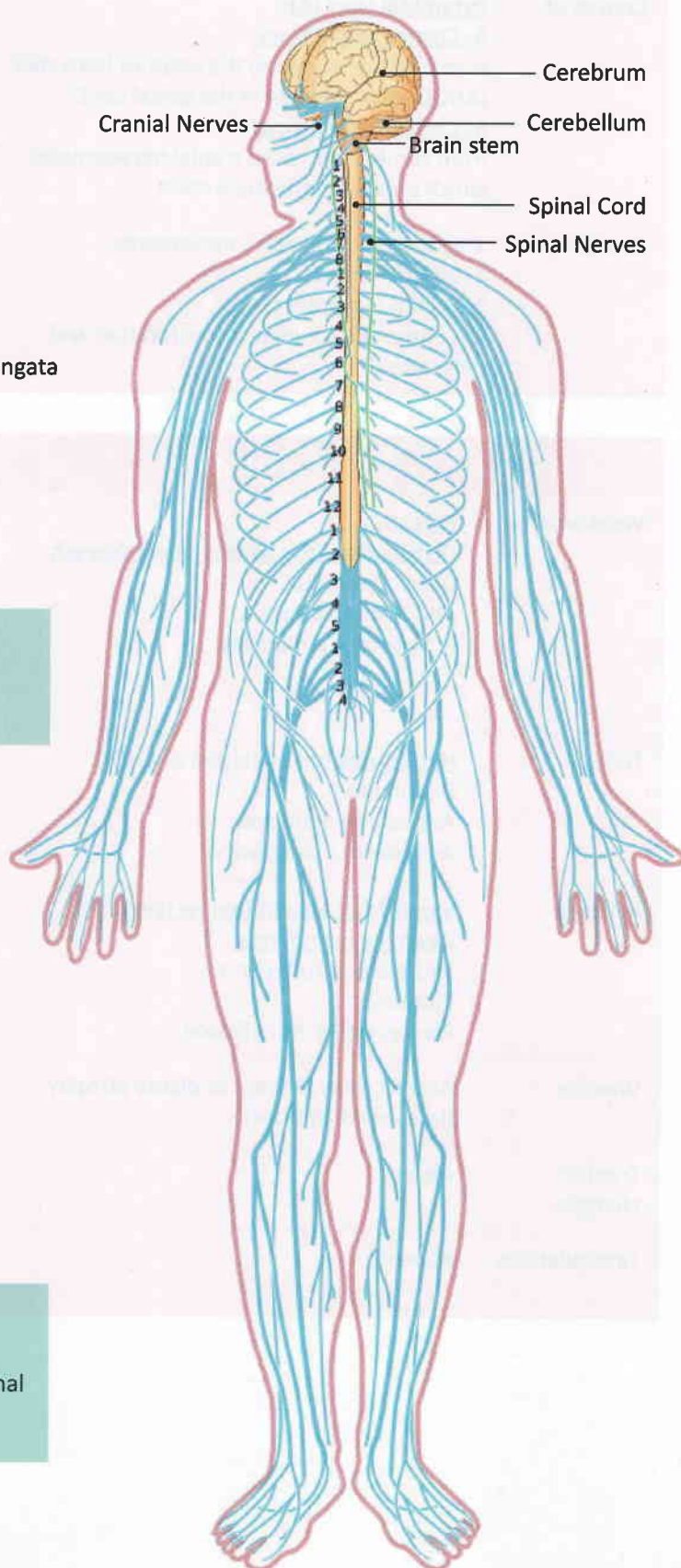
Number: 12 pairs
Origin: brain & its stem
Exit: skull
Supply: head and neck

Spinal Nerves:

Number: 31 pairs
Origin: spinal cord
Exit: vertebral column
Supply:
Cervical: upper limb
Thoracic: trunk
Lumbar: lower limb
Sacral: lower limb
Coccygeal: perineum

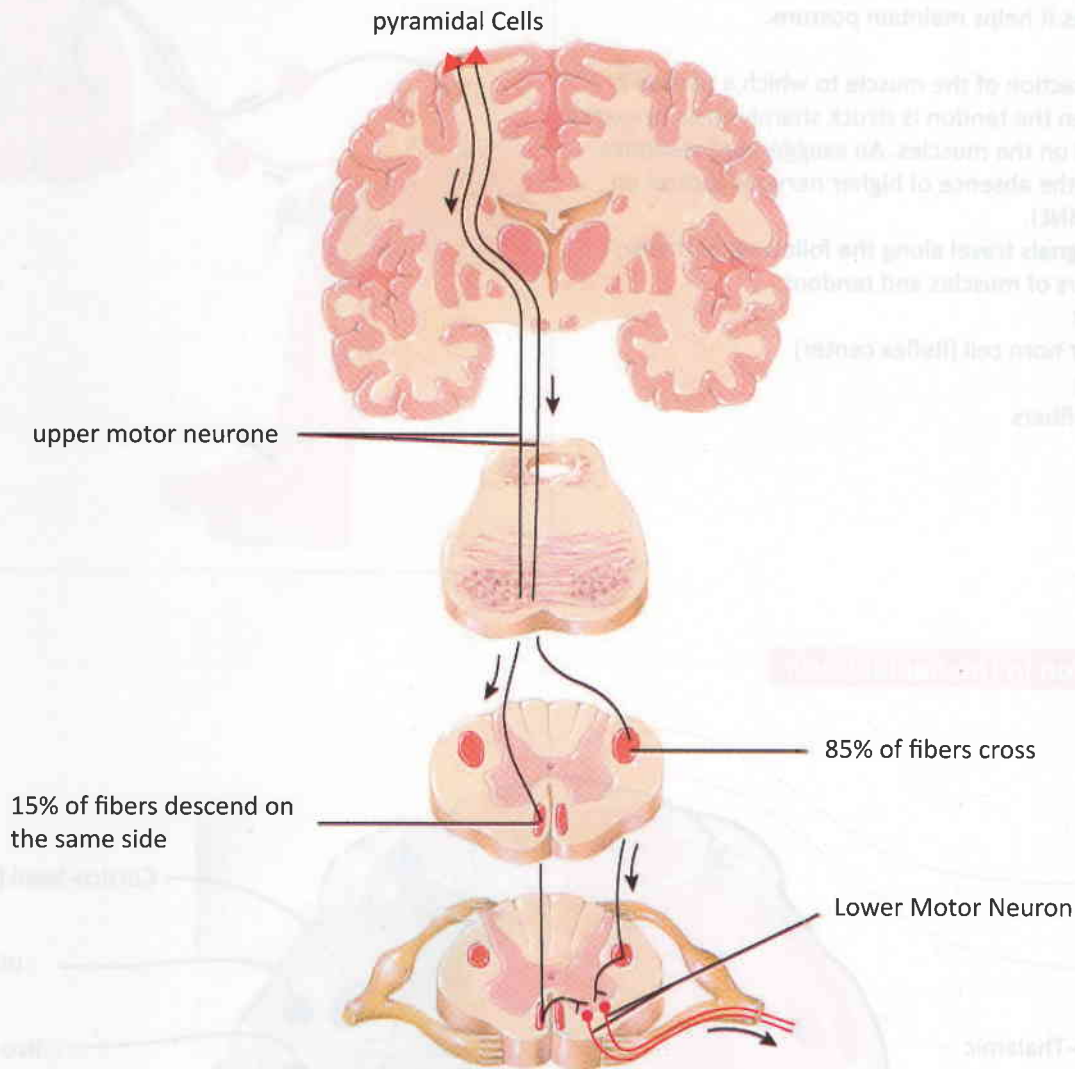
► **N.B.****Cauda equina:**

last 10 spinal nerves (lumbosacral) because spinal cord is shorter than vertebral column.



	U.M.N. (Pyramidal (Δ) + Extrapyramidal tracts)	L.M.N.
Consist of	<u>Pyramidal tract (Δ):</u> <u>A- Cortico spinal tract:</u> from cerebral cortex to the anterior horn cells (AHCs) which present in the spinal cord. <u>B- Corticobulber tract:</u> from cerebral cortex to cranial nerves nuclei which present in the brain stem.	From AHCs to the effector muscles: <u>AHCs >> roots >> P.N. >> neuromuscular junction >> muscles.</u> Or from cranial nerves nuclei to the effectors muscles: <u>Cranial nerves nuclei >> cranial nerves >> neuromuscular junction >> muscles.</u>
Functions	1- Initiate the voluntary movements. 2- Inhibits AHCs. 3- Skillful movements . 4- Control the sphincters (micturation and defecation).	1- Perform the voluntary movements. 2- Vitality of muscles & their surrounding structures (skin - hair - nails).

	U.M.N.L	L.M.N.L.
Weakness	<u>Paresis.</u> <u>Distribution (the degree of weakness):</u> Distal > proximal. Abductor > adductor. Progravity > antigravity.	<u>Paralysis .</u> <u>Distribution:</u> for example Peripheral neuropathy: L.Ls. > U.Ls. Distal > proximal. Extensor > flexor. ± adductor > abductor.
Tone	<u>Hypertonia</u> (no inhibition of AHCs). Distribution: Adductor > abductor. Antigravity > progravity.	<u>Hypotonia.</u>
Reflexes	<u>Superficial: absent (below level).</u> <u>Deep: hyper-reflexia.</u> Pathological reflexes: ± . Clonus: ± . Planter reflex: dorsiflexion.	<u>Superficial: absent (at level).</u> Hypo-reflexia. Planter flexion or absent (equivocal).
Wasting	Absent: may present as disuse atrophy (late - mild - diffuse).	Present (early - marked - localized).
Trophic changes	Absent	Present
Fasciculations	Absent	Present (irritation of AHCs)

► **N.B.**

Superficial reflexes take facilitator fibers from both U.M.N. & L.M.N. so, they are absent in both U.M.N.L. (below the level) & L.M.N.L (at the level)

Pathological reflexes: reflexes which are normally absent, its presence indicates U.M.N.L., as adductor, patellar and finger flexion reflexes; (don't elicit them in patient with normo or hypo reflexia)

Clonus: rhythmic contraction of the muscles after sudden sustained stretch of the tendon. If present indicate severe U.M.N.L. as (wrist and ankle clonus).

Fasciculation: an oscillatory movement of the muscles caused by an irritating lesion of the AHCs.

Causes of Fasciculation:

- 1- Motor neuron diseases
- 2- Thyrotoxicosis
- 3- Cervical spondylosis
- 4- Siringomyelia
- 5- Acute poliomyelitis
- 6- Metabolic: Severe hyponatremia , severe hypomagnesemia
- 8- Drugs (Clofibrate, lithium, anticholinesterase & Salbutamol)

Important concepts:

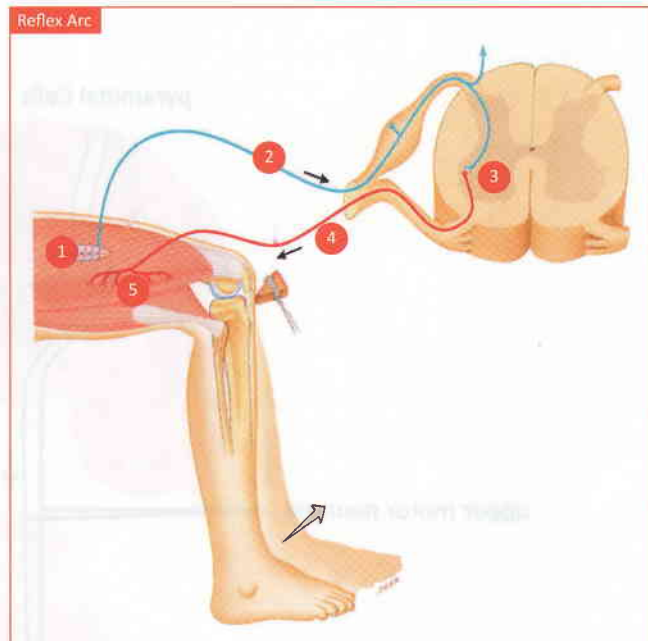
Muscle tone: continuous and passive partial contraction of the muscles. It helps maintain posture.

Tendon Jerk:

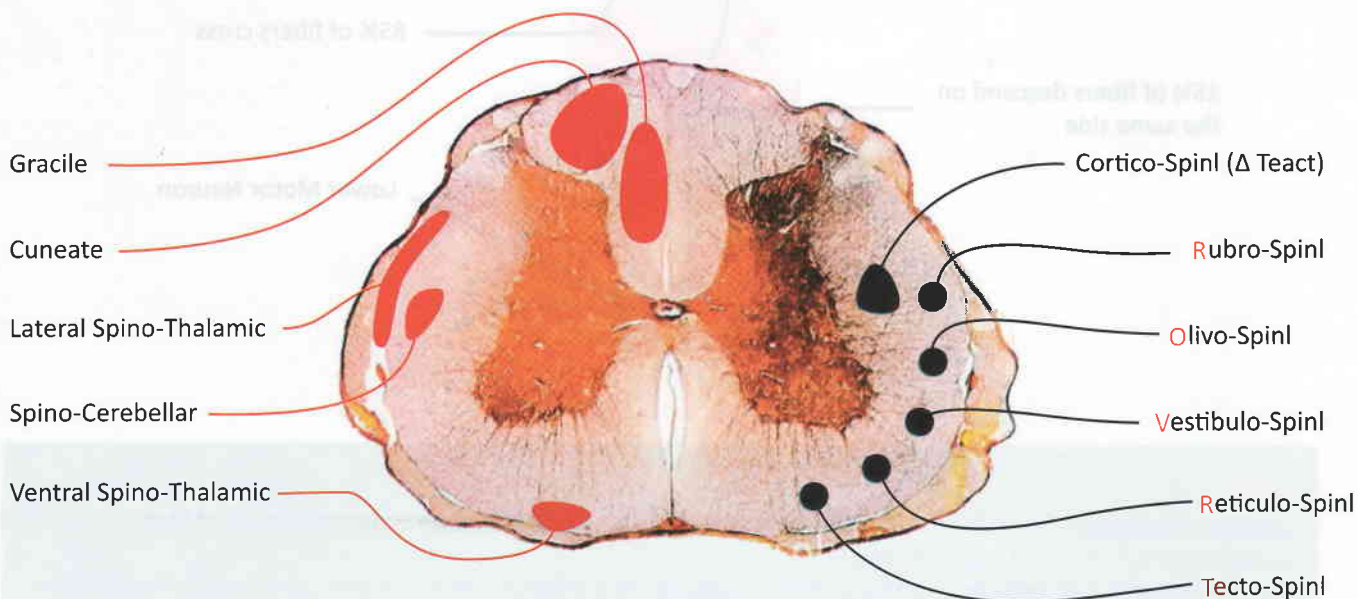
A reflex contraction of the muscle to which a tendon is attached when the tendon is struck sharply so as to exert a sudden pull on the muscles. An exaggerated response may indicate the absence of higher nervous control on the reflex (UMNL).

Reflex Arc: signals travel along the following pathway:

- 1- receptors of muscles and tendons
- 2- Afferent
- 3- Anterior horn cell (Reflex center)
- 4- Efferent
- 5- Muscle fibers



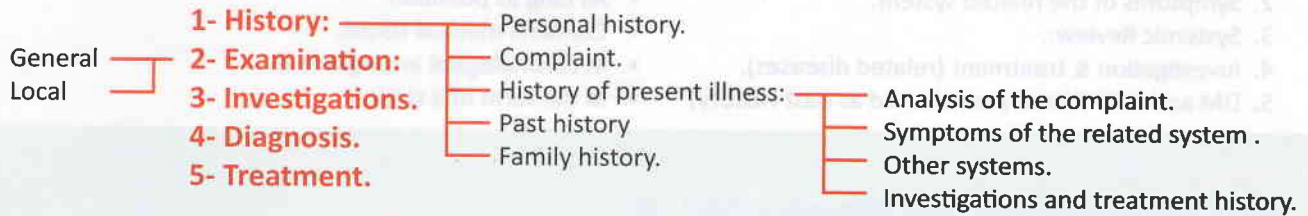
► Transection in the Spinal Cord:



Relation between vertebrae & segments:

Vertebrae	Spinal cord segments
C 1 - 3	+0
C 4 - 7	+1
T 1 - 6	+2
T 7 - 12	+3
L1 or below	Cauda equina lesion

NEUROLOGICAL SHEET



NEUROLOGICAL HISTORY

► Personal History:

1. **Name:** اسم حضرتك ايه؟
to be familiar with the patient.
2. **Age:** عندك كام سنة ؟
As certain diseases are more common in certain ages, e.g.

First decade:	Second decade:	3rd & 4th decade:	5th & 6th decade:
Fredrich's ataxia. Duchenn myopathy.	Hereditary spastic ataxia. Baker's myopathy. Peroneal muscle atrophy.	DS	Cerebrovascular stroke

3. **Sex:**
Motor neuron disease (M.N.D.) is common in males.
Migraine is more common in females.
4. **Occupation:** بتشتغل ايه؟
persons in certain occupations are more susceptible to certain diseases e.g. disc prolapse is more common in drivers while lead neuropathy is commoner in printers.
5. **Marital state:** متزوج؟ عندك اولاد؟ كام ؟ اصغرهم عنده كام سنة؟
for possible sterility or impotence.
6. **Residence:** ساكن فين؟
e.g. migraine is commoner in urban areas, while nutritional diseases are commoner in rural areas.
7. **Special habits:**
بتدخن؟ كام سيجارة في اليوم؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
بتشرب خمر أو مخدرات؟ بطريقة منتظمة ولا في المناسبات؟ نوع الخمر ايه؟
e.g. alcohol can lead to peripheral neuropathy, tremors, amnesia & confabulation (Korsacoff syndrome).
8. **Handedness:**
in right handed people the dominant hemisphere is the left.

► N.B.

Left handed peoples:

- 1/3 of them: dominant left hemisphere.
- 1/3 of them: dominant right hemisphere.
- 1/3 of them: bilateral.

► Complaint:

On patient's own words + duration ايه اللي تاعبك ؟ إيه اللي جابك المستشفى؟ بقاله اد ايه التعب ؟
(take the most recent and most important complaint and it should be brief)
Example: Patient is complaining of heaviness of right UL and LL of 2 days duration.

► History of present illness (H.P.I.):

1. Analysis of complaint.
2. Symptoms of the related system.
3. Systemic Review:.
4. Investigation & treatment (related diseases).
5. DM and HTN (Usually considered as past History)

HPI should be:

- As long as possible.
- Contains medical terms.
- In chronological arrangement.
- In the form of a story.

► N.B.

History of present illness is highly diagnostic in C.N.S. As:

Etiological Diagnosis: From only onset and course

Anatomical and pathological diagnosis: From analysis of symptoms of C.N.S

Trauma can be easily excluded from history (no history of trauma).

Inflammation is associated with fever, headache and malaise.

1- Analysis Of The Complaint:**1. Onset:** الأعراض بدأت فجأة ولا بالتدريج؟ في خلال اد ايه الأعراض ظهرت؟ / الشكوى دي ظهرت فجأة ولا بعد أد إيه؟

From beginning of symptoms until the establishment of the disease. It may be acute or gradual.

- **Acute onset (less than 14 days):**

Seconds: Sudden e.g. embolus or trauma.

Minutes: Dramatic or Apoplectic e.g. hemorrhage.

Hours: Rapid e.g. thrombosis.

Days < 14 days: e.g. inflammation.

- **Gradual onset (14 days or more):**

In **degenerative diseases**, as diabetic P.N. or space occupying lesions (S.O.L.) as tumors.

2. Course: الأعراض ظهرت بالتدريج ولا على مدى أسابيع وشهور؟ أو بتحدث في نوبات؟

From the establishment of the disease until recovery or complications. It may be progressive, regressive, stationary, remittent or intermittent.

- **Remittent:** in attacks, patient in between attacks is diseased as multiple sclerosis.
- **Intermittent:** in attacks, patient in between attacks is healthy (symptoms free) as epilepsy & migraine.

Acute onset is always followed by **regressive** course while **gradual onset** followed by **progressive** course.

2- Symptoms of C.N.S.: (TNM 4S + hypothalamus)

- 1- **T** Increases IntraCranial Tention (ICT)
- 2- **N** Central Nervous System Symptoms
- 3- **M** Motor Symptoms
- 4- **S** Sensory Symptoms
- 5- **S** Sphincter troubles
- 6- **S** Speech troubles
- 7- **S** Systemic Review (usually considered as a seperate item)
- 8- **+** Hypothalamic Manifestation

1. I.C.T.:

Bursting headache, projectile vomiting, blurring of vision ± coma, ± convulsions.

هل عندك صداع مستمر لا يستجيب للمسكنات؟ هل حدث لك قيء؟ هل عينك زغللت؟

2. Cranial nerves:

See later.

3. Motor System:

1. Weakness.
2. Involuntary movement.
3. Co-ordination.

1. Weakness Analysis: 13 points: (onset, course, duration + 5 character + 5 distribution)**5 characters**

1. Degree.
إلى عندك ضعف ولا شلل؟
2. Tone.
عضلاتك سايبة ولا مخشبة؟ شدت عليك من البداية؟
ولا بعد المرض ما حصل بشوية؟
3. Wasting (onset - degree).
هل عضلاتك خست؟ ولا حجمها عادي؟
4. Trophic changes.
هل أظافرك بتتقصف؟
5. Fasciculation.
هل عندك رفة في عضلاتك؟

5 distribution

1. U.L. / L.L. or both.؟ إيدك ولا رجلك؟ ولا الأثنين؟
2. Right / left or both.؟ ولا الأثنين؟
3. Proximal or distal.
• Upper limb. تعرف تعصر الليمونة أحسن ولا تسرح شعرك؟
• Lower limb. تطلع السلم أحسن ولا تلبس الشبشب؟
4. Abductor or adductor.
• Upper limb. تلبس الجاكت أفضل ولا تضع كتاب تحت باطك؟
• Lower limb. تحط رجل على رجل ولا تشلها أسهل؟
5. Flexor or extensor.
• Upper limb. إيه أسهل، تفتح الدرج ولا تقفله؟
• Lower limb. تلبس البنطلون ولا تفرد رجلك فيه أسهل؟

2. Involuntary Movements Analysis: 13 points: (onset, course, duration + 5 character + 5 distribution)**5 characters**

1. Static or kinetic.؟ بتظهر أكثر مع الحركة ولا مع السكون؟
2. Regular or irregular.؟ منتظمة ولا غير منتظمة؟
3. Tone.
عضلاتك سايبة ولا مخشبة؟ شدت عليك من البداية ولا بعد المرض ما حصل بشوية؟
4. Increased by.؟ بتزيد بإيه؟
5. Decreased by.؟ بتقل بإيه؟

5 distribution

1. U.L. / L.L. or both.؟ في إيدك ولا رجلك؟
2. Right / left or both.؟ يمين ولا شمال؟
3. Proximal or distal.؟ ناحية الجسم ولا بره؟
4. Head and neck.؟ فيه هزة في رأسك أو رقبتك؟
5. Trunk.؟ فيه حركات لا إرادية في جسمك؟

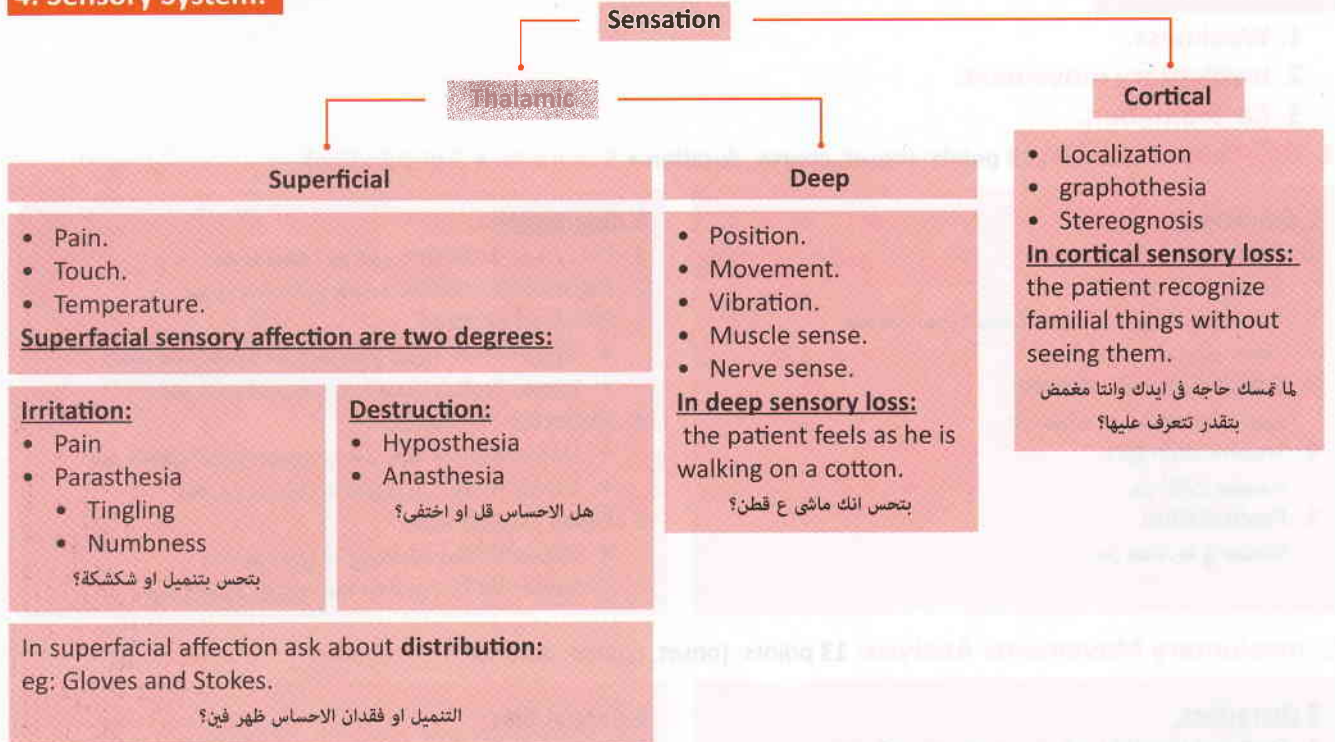
3. Co-ordination:

Cerebellum		Deep Sensation	
Upper limb	lower limb	Upper limb	lower limb
Shaking movement Or, tremors during eating لما بتأكل الأكل بيوصل لفمك؟	Drunken gait. بتمشي طبيعي ولا بتتطوح زي السكران؟	بتعرف تربط زرار البدله؟ بتعرفي تقفلي سوستة الفستان؟	Falling while closing eyes لو غمضت عينيك وأنت بتغسل وشك بتقع؟

Be kind to your patient and use appropriate words when asking about symptoms. and try to make history taking as smooth as possible. you should also be familiar to the different words in each culture reflecting the same meaning.



4. Sensory System:



Radicular, root or girdle pain: (with dermatome)

Special type of pain in neurology. increases by cough and straining and decrease by rest and support.

Value

- Paraplegia (leveling).

- Cauda equina.

5. Sphincter troubles :

- Micturition
- defecation
- sexual function

Centre: autonomic center (S2,3,4)

- هل عندك مشاكل في التبول ؟ بتبول على نفسك ؟
البول بيسبقك قبل ما تدخل الحمام ؟
البول بيتأخر لما بتدخل الحمام ويبطئ على بال ما بينزل ؟
هل عندك مشاكل في المعاشرة الزوجية ؟
أخبار الإنتصاب الصباحي إيه ؟
بتأخذ أدوية ؟

► Neurogenic Bladder:

Innervation of the human urinary bladder:

1. Parasympathetic like any visceral organ of the body S2,3&4
2. sympathetic has no active role in human

Control of micturition:

- The wall of the bladder contains special receptors (**Stretch and chemical**) stimulated by stretch of bladder wall and the acidity of urine. signals are carried by sensory nerves to the micturition center **S2,3&4**. Motor nerves emerge from the center to the bladder causing wall contraction and sphincter relaxation (in infants)
- Sensory fibers also reaching the center S2,3&4 ascend in the posterior column to the brain where the sensation of fullness is perceived. Higher center of micturition (**Paracentral lobule**) send inhibitory fibers through pyramidal tract to inhibit the reflex.
- Micturition occurs only when the inhibitory impulses are released.

Lesions:

LMNL (at the reflex arc):

- **Sensory lesion (sensory atonic bladder)** characterized by:

- Loss of fullness sensation (painless)
- Retention of urine with huge size bladder
- Dribbling of urine every now and then because of overflow

- **Both sensory and motor lesion (Autonomic bladder)** characterized by:

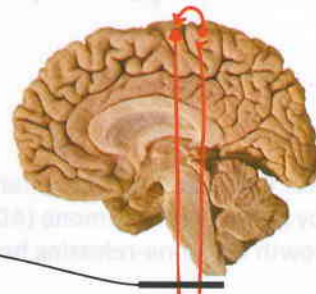
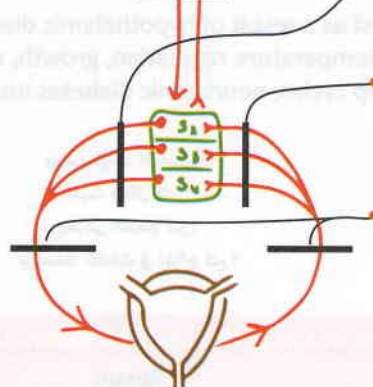
- Incomplete, irregular, involuntary evacuation.
- Evacuation depends on the bladder myogenic action

- **Motor lesion (Motor atonic bladder)** characterized by:

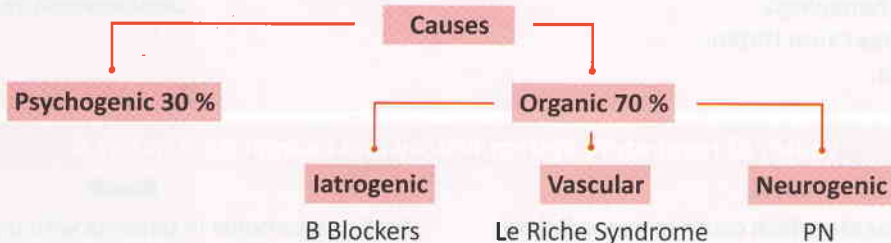
- Intact fullness sensation (painful)
- Inability to evacuate the bladder
- catheter is usually used to evacuate

Summary of bladder affection in neurology:**Unilateral UMNL:** No effect**Bilateral UMNL:**

- Acute: (shock)
Retention with overflow
- Gradual:
 - Partial: **Percipitancy**
 - Complete: **Automatic bladder:**
(loss of upper control)
as infants:
Involuntary, Complete, regular

**LMNL:****Efferent lesion****Motor Atonic Bladder****Painful retention****Afferent lesion****Sensory Atonic Bladder****Painless retention****Afferent and Efferent lesion****Autonomic Bladder****Involuntary, Irregular, Incomplete****► Erectile Dysfunction (Impotence):**

Definition: Inability of male to maintain an adequate erection sufficient for satisfaction of his female partner. May be partial or complete.

Causes:**Approach for diagnosis of impotence:**

1. Ask about sexual function.
2. Ask about morning erection.
 - If absent : organic.
 - If intact : psychogenic.
3. Drugs history (anti hypertensive drgus) for iatrogenic organic impotence which is reversible.
4. Testicular sensation which is absent in neurogenic impotence but intact in vascular causes.

► N.B.**Le Riche syndrome:**

Aorto-iliac block with occluded both internal iliac arteries occlusion of median sacral artery which supplies nerve erigent (S2, 3) which is responsible for erection.

6. Speech troubles :

هل عندك مشاكل في الكلام ؟ There is speech troubles or no without details.

7. Systemic Review:

Usually considered as a separated item... see next

8. Hypothalamic Manifestation:

- The hypothalamus is the control center for several endocrine functions. Endocrine systems controlled by the hypothalamus are regulated by anti-diuretic hormone (ADH), corticotropin-releasing hormone, gonadotropin-releasing hormone, growth hormone-releasing hormone, oxytocin, all of which are secreted by the hypothalamus.
- Numerous dysfunctions manifest as a result of hypothalamic disease. Damage to the hypothalamus may cause disruptions in body temperature regulation, growth, weight, sodium and water balance, milk production, emotions, sleep cycles, neurogenic diabetes insipidus, tertiary hypothyroidism and developmental disorders.

موعيد نومك اذخبطت؟

بقيت بتاكل كثير؟

بتدخل الحمام كثير؟

بيحصلك تقلبات في المزاج كثير؟

3- Systemic Review:**Vaules of C.V.S. history and examination in C.N.S.**

Cause	Result	Association
- Mitral stenosis may be complicated by atrial fibrillation which causes embolic hemiplegia. - Hypertension may cause thrombotic hemiplegia.	Silent myocardial infarction in diabetic P.N.	Herdiofamilial ataxia and myopathy may be associated with cardiomyopathy.

Vaules of respiratory system history and examination in C.N.S.

Cause	Result
T.B. >> pott's disease which cause extramedullary compressive paraplegia.	Static pneumonia in patients with prolonged rest in bed as patients in shock stages.

- Causes of fever in C.N.S.:**
1. Meningitis.
 2. Encephalitis.
 3. Encephalomyelitis.
 4. Poliomyelitis.
 5. Peripheral neuritis.
 6. Myositis.
 7. Subarachnoid hemorrhage (low grade).

4- Investigation & treatment (related diseases) :

What you exactly write should be like:

patient investigated by CT, MRI, MRI with diffusion and treated by clexan, etc

if all are negative:

no symptoms suggest other systems affection.

5- DM and HTN:

DM and HTN are usually considered as past history, but they better be considered as present history as they are highly important and never cured (controled not cured).

- Diabetes Mellitus: عندك سكر ؟ من إمتى ؟ أخذت علاج إيه ؟ جرعتيه أد إيه ؟ آخر تحليل سكر كان كام ؟ حصل أي مضاعفات ؟
- Hypertension: عندك ضغط ؟ من إمتى ؟ أخذت علاج إيه ؟ جرعتيه أد إيه ؟ آخر مرة قياست الضغط كان كام ؟ حصل

► **Past History:**

1. **Similar attacks.** الشكوى ا تكررت قبل كذا ؟

2. **Chronic diseases** as D.M., hypertension and T.B.

- **Diabetes Mellitus:** عندك سكر ؟ من إمتى ؟ أخذت علاج إيه ؟ جرعته أد إيه ؟ أخر تحليل سكر كان كام ؟ حصل أي مضاعفات ؟
- **Hypertension:** عندك ضغط ؟ من إمتى ؟ أخذت علاج إيه ؟ جرعته أد إيه ؟ أخر مرة قياست الضغط كان كام ؟ حصل أي مضاعفات ؟
- **T.B.:** جالك زمان كحة ودم وبلغم ؟ كنت بتسخن بليل وتبل الملاية عرق ؟ اتحجرت في مستشفى الصدر وأخذت علاج لفترات طويلة ؟
- **Hepatitis:** لو عينيك بقا أصفر ؟ لون البول اتغير ؟ رحت الحميات ؟
- **D.V.T.:** رجلك ورمت ووجعتك ؟ حجزوك في المستشفى قبل كده وأدوك مسيلات للدم ؟

3. **Trauma.** عملت حوادث قبل كده ؟ أو أصبت إصابات في جسمك أو رأسك أو العمود الفقري ؟

4. **Major operations.** (complications of general or spinal anaesthesia).

عملت عمليات جراحية قبل كده ؟ عملية إيه ؟ من إمتى ؟ حصل بعدها مضاعفات أو تلوث في الجرح ؟

5. **blood transfusion.** نقلت دم ؟

6. **Fevers.** هل جت لك حمة قبل كده ؟ استمرت معاك كام يوم ؟

7. **Drug allergy and intake:** بتأخذ أدوية بصفة مستمرة ؟ عندك حساسية من أي دواء ؟

- **P.N.:** caused by isoniazide.
- **Myopathy:** caused by steroids, chlorquine and vincristine.
- **Ataxia:** caused by phynytoin (toxicity)

► **Family History:**

Some diseases in neurology has hereditary factors:

- autosomal recessive: Friederich's ataxia
- autosomal dominant: Hereditary spastic ataxia & peroneal muscle atrophy
- X-linked: Pseudo hypertrophic myopathy

حد في العائلة اشتكي من نفس الشكوى ؟ الأب والأم قرايب ؟

NEUROLOGICAL EXAMINATION

Don't get lost; Examination: General and Local:

1. General examination.
2. Mentality.
3. Speech.
4. Cranial nerves.
5. Motor system.
6. Reflexes.
7. Sensory system.
8. Back.
9. Gait.
10. Other systems

1. General Examination:

- A** **أرقام** **Vitals: Blood pressure, pulse, Respiratory rate, Temperature.**
- B** **Built:** Over built, average built or under built
- C** **Complexion:** pallor, jaundice and cyanosis:
- D** **Decubitus or position** see pictures later in inspection section
- E** **Neck vein (H & N)**
Clubbing (upper limb) & Flapping tremors in respiratory failure (CO₂ retention)
Lower limb edema (lower limb)
- F** **فكر** **Mentality:** Disturbed level of consciousness (see later)
Face + general look.

2. Mentality:

1. Consciousness level (fully conscious, semi-conscious or comatose and if comatose assess GCS).
2. Orientation (time, place and persons).
3. Mood (average, depressed, euphoric).
4. Memory (old and recent).
5. Behavior (co-operative or not).
6. Intelligence.

► Glasgow Coma Scale (GCS):

This is an objective score of consciousness.

Repeated testing is useful for judging whether coma is deepening or lifting.

Note that the lowest score in each category is 1, meaning that the lowest possible GCS = 3 (even if the patient is dead). and the highest score is 15.

Eye opening (max 4 points)		Best verbal response (max 5 points)		Best motor response (max 6 points)	
4	Spontaneously open	5	Conversing and orientated (normal)	6	Obedying commands (raise your hand)
3	Open to (any) verbal stimulus	4	Conversing but disorientated and confused	5	Localizing to pain (moves hand toward site of stimulus)
2	Open in response to painful stimulus	3	Inappropriate words (random words, no conversation)	4	Withdraws to pain (pulls hand away from stimulus)
1	No eye opening at all	2	Incomprehensible sounds (moaning, etc.)	3	Abnormal flexion to pain (decorticate posturing)
		1	No speech at all	2	Abnormal extension to pain (decerebrate posturing)
				1	No response at all

Example: The patient is fully conscious, well oriented to time, place and persons, with good mood and memory, he is co-operative with an average intelligence.

3. Speech:

Communication with others via verbal, writing or movement.

► Development of Speech**When the baby is born:**

- he received sensations from the surrounding in the Visual Sensory area (area 17) in the occipital lobe.
- Repetition of these sensations leads to insertion, storage and recognition in Visual Psychic areas (areas 18 & 19).

Similarity in the Auditory impulses

- Sensations → Auditory Sensory area (area 41 & 42) in the Temporal lobe.
- Repetition of these sensations leads to insertion, storage and recognition in → Auditory Psychic areas (areas 22).

Example : when he sees his mother, see (area 17), recognize (area 18) hear her voice (area 41, 42).

at the age of 1 : 1.5 years:

Broca's area (area 44) in frontal lobe is developed so, he can imitate sounds he has perceived.

at the age of school:

- he starts to learn letters & numbers so, he begins to develop a special visual psychic area (39) in angular gyrus in parietal lobe.
- when he wants to write the stored image in area 39 → it requires development of a special cortical motor center for writing (Exner's area).
- Association between visual & Auditory Psychic area allow him to correlate between the image he sees & the sounds related to them.
- this requires associative area (37) in the parietal lobe which also sends association fibers to Broca's and Exner's areas.
- impulses from the Broca's area or from Exner's area reach the Motor area (area 4) descend in Δ tract to reach the nuclei of the cranial nerves (supplying the muscles of articulation) and the A.H.C (supplying the muscles concerned with writing).

► Speech Disorders**1. Formulation:** aphasia or dysphasia

- **Sensory**
 - auditory agnosia: lesion in area 22
 - visual agnosia: lesion in area 18 and 19
 - Alexia: lesion in area 39
- **Motor:**
 - verbal aphasia: lesion in Broca's area (44) = **expressive aphasia**.
 - Agraphia: lesion in Exner's area (45)
- **Jargon's aphasia:**
lesion of the associated area (37) = **salad word**

2. Articulation: Dysarthria

- Δ tract >> **slurred speech**.
- Extra Δ tract >> **monotonous speech**.
- Cerebellum >> **staccato speech**.
- Basal ganglia >> **choreic speech**.
- Cerebellum + Δ tract >> **slurred staccato (scanning)**.

4. Cranial Nerves: See later**5. Motor System Examination:**

- 1. Inspection: muscle state.**
- 2. Palpation: muscle tone.**
- 3. Percussion: fasciculation and myotonia.**
- 4. Power.**
- 5. Co-ordination.**

1. Inspection: (muscle state):

1. Position
2. Deformities
3. Wasting
4. Trophic Changes

1. Position (posture):

- Semi flexed upper limb and hyper extended lower limb in spastic hemiplegia.
- Adducted, hyper extended both lower limbs in spastic paraplegia.
- Dropped wrists & feet in P.N.
- Semi flexed, abducted both lower limbs in myopathy.

2. Deformity

Cause: Pott's disease causes paraplegia.

Result:

- Pes-cavus in P.N.
- Talipes equines in myopathy.

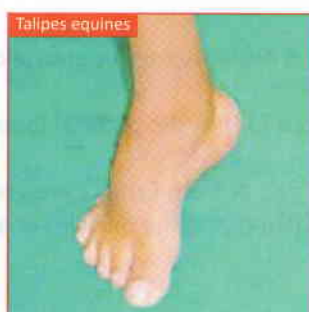
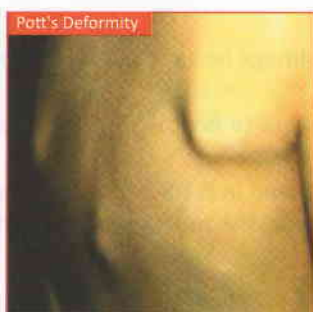
Association: Pes-cavus in herdio-familial diseases as ataxia and myopathy.



Hyper Extended both LL



Semiflexed UL & Hyper Extended LL



3. Wasting (atrophy)

Comparison:

- Between both sides in unilateral diseases.
- Between the limb with itself in bilateral symmetrical diseases as inverted champagne bottle in peroneal muscle atrophy.

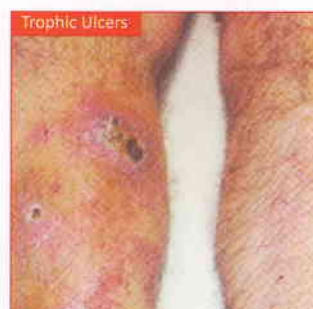
Wasting landmarks:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Upper limb <ul style="list-style-type: none"> • Proximal: Flat shoulder • Distal: Flat thenar and hypothenar. Prominent M.C.B. (Guttering) | <ul style="list-style-type: none"> • Lower limb <ul style="list-style-type: none"> • Proximal: Flat buttock. • Distal: Pes-cavus. Prominent M.T.B. |
|--|---|



4. Trophic changes

- Loss of hair in upper limb or lower limb.
- Brittle nails.
- Trophic ulcers.



2. Palpation (Muscle Tone):

Ask the patient to relax first: سيب نفك

Upper Limb		Lowe Limb		
Wrist: upside down shaking		Ankle: side to side shaking.		
Elbow: passive flexion & extension.		Knee: passive flexion & extension.		
Shoulder: 2 methods.		Hip: 3 methods.		
Circumduction.	Gower method.	Rolling For hypertonia	frog's sign For hypotonia,	Circumduction For both hyper & hypotonia

Causes of hypertonia:

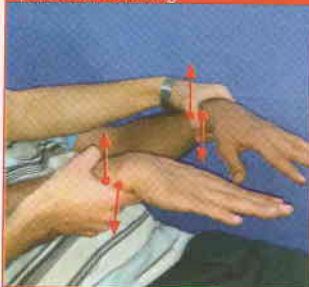
1. Δ tract lesion: **clasp knife spasticity** (resistance in beginning of movement only).
2. **Extra Δ tract lesion: lead pipe rigidity** (resistance all over the movement) or **Cog-wheel rigidity** (interrupted by tremors).
3. Myotonia 4. Catatonia 5. Meningeal irritation.

Causes of hypotonia:

1. Lesion of reflex arc:
 - Afferent = P.N. = Tabes dorsalis.
 - Centre "AHCs" = polio, motor neuron disease "M.N.D".
 - Efferent = P.N. "motor"
 - Effector = myopathy - myasthenia.
2. Posterior column lesion.
3. Cerebellar lesion except "Marie's"
4. Extra Δ >> chorea.
5. Shock stage.

	Spasticity	Rigidity
Site of Lesion	Pyramidal	Extra Pyramidal
Distribution	Distal > Proximal Flexors of UL Extensors of LL	Proximal > Distal Flexors of UL Flexors of LL
Character	Clasp Knife	Lead Pipe or Cog-wheel
Deep Reflexes	Hyper-reflexia	Hypo-reflexia

Upside down shaking



Check tone by passive movement



Side to side shaking



Check tone by passive movement



Elbow flexion and extension



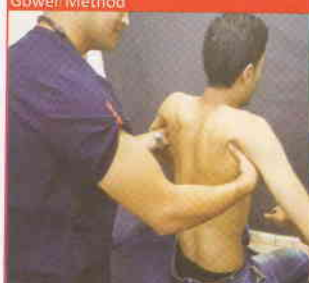
Shoulder circumduction



Knee flexion and extension



Gower Method



Check for frog sign



Check for frog sign



Rolling method (look at the body)



Circumduction method



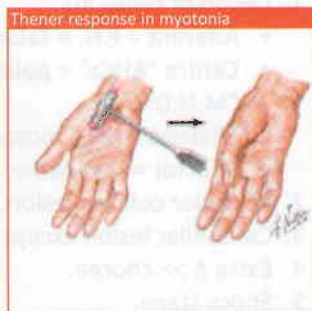
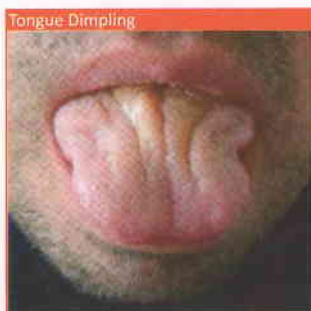
3. Percussion (fasciculation & myotonia):

Fasciculation: an oscillatory movement of the muscles caused by an irritating lesion of the AHCs.

Myotonia:

Delayed relaxation of skeletal muscle.

- Voluntary: ask the patient to catch anything or shake hand.
- Mechanical: by "percussion"
 - On **tongue**: dimpling.
 - **Thenar eminence**: dimpling.
- Electrical.

**4. Power:****Routine Examination:**

- **Limbs.**
 - From distal to proximal.
 - Flexion then extension.
 - Abduction then adduction.
 - Fix the joint that follow the joint examined.
 - Start **without resistance then against resistance.**
- **Trunk.**
 - Ask patient to rise from bed.
 - Observe umbilical movement.

► Upper Limb Muscles Examination:

Root	Action	Muscle
C1,2	Lateral movement of neck	Sternomastoid & trapezius
C3,4	Elevation of shoulder	Supra and infraspinatus
C5	Abduction of shoulder	Deltoid
C5,6	Flexion of elbow	Biceps & brachioradialis
C6,7	Extension of elbow	Triceps
C7,8	Extension of wrist	Extensors of wrist
C8, T1	Flexion of wrist & movement of small ms of hands	Flexors of wrist

Hand (C8, Th 1)

- **Thumb:**
 - **Opponens pollicis:** ask the patient to touch the tip of his little finger with the tip of his thumb.
 - **Abductor pollicis brevis:** it is the only muscle of his hand supplied by the median nerve than can be easily tested (as in carpal tunnel syndrome). Ask the patient to abduct his thumb at a right angle to the palm of the hand, the muscle can be seen and palpated.
- **Other fingers:**
 - **Abductors:** dorsal interossei: patient abducts his fingers against resistance.
 - **Adductors:** palmar interossei: patient grasps a paper between 2 fingers.
 - **Lumbricals:** patient puts his fingers in the writing position.
 - **Flexors Digitorum:** Flexion of fingers
 - **Extensor Digitorum:** Extension of the fingers

► N.B.**Causes of Fasciculation:**

may be physiological as with coffee, stress or pathological as:

- 1- Motor neuron diseases
- 2- Thyrotoxicosis
- 3- Cervical spondylosis
- 4- Syringomyelia
- 5- Acute poliomyelitis
- 6- Metabolic:
- Severe hyponatremia , severe hypomagnesemia
- 8- Drugs (Clofibrate, lithium, anticholinesterase & Salbutamol)

Medical Research Council scale for muscle power (degree of muscle power):

0	No muscle contraction visible.
1	Flicker of contraction but no movement.
2	Joint movement when effect of gravity eliminated.
3	Movement against gravity but not against examiner's resistance.
4	Movement against resistance but weaker than normal.
5	Normal power.

Wrist (C7,8)

- **Flexor Carpi:** Wrist flexion
- **Extensor Carpi:** Wrist extension

Elbow (C5,6,7)

1. **Flexors:** biceps, brachialis & brachioradialis.
 - **Biceps:** with the patient's arm extended by his side & the hand fully supinated. Ask him to flex his elbow against resistance.
 - **Brachioradialis:** as for the biceps but with the hand semi-pronated.
2. **Extensors:** triceps, with the patient's elbow flexed ask him to extend it against resistance.

Shoulder (mainly C4 - C5)

1. **Adductors:** pectoralis major & minor assisted by latissimus dorsi & teres major.
Ask the patient to adduct his arm against resistance or while patient presses his hands to his waist. Palpate the anterior axillary fold for the contracted pectoralis.
2. **Abductors:**
 - 0° - 15° supra spinatus.
 - 15° - 90° deltoid.
 - 90° - 180° trapezius.

3. **Flexors:** anterior fibers of deltoid. Ask the patient to raise his arm forwards against resistance.
4. **Extensors:** posterior fibers of deltoid. Ask the patient to push his arm backward against resistance.
5. **Lateral rotators:** infraspinatus & teres minor.
6. **Medial rotators:** latissimus dorsi & subscapularis.
7. **The serratus anterior:** ask the patient to push his arm forward against resistance, paralysis of this muscle leads to winging of the scapula.

Abduction of fingers



Adduction of fingers



Flexion of fingers



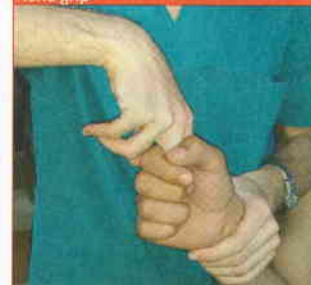
Extension of fingers



Opponent Power



Hand grip



Wrist flexion



Wrist Extension



Elbow Flexion



Elbow Extension



Shoulder Flexion (both sides)



Shoulder Extension (both sides)



Abduction (both sides)



Adduction (both sides)

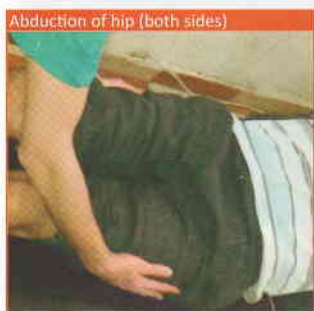
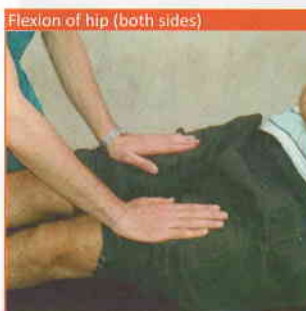
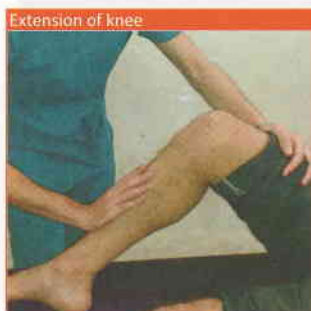
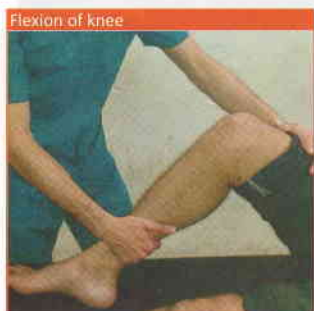
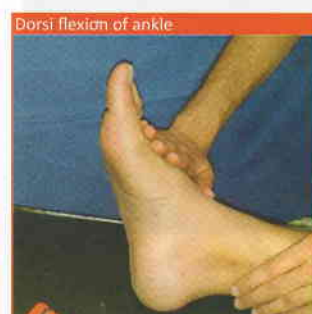
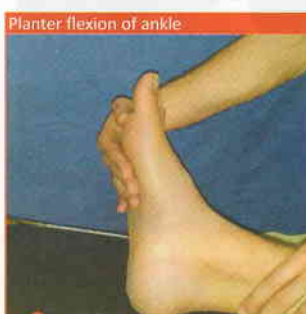
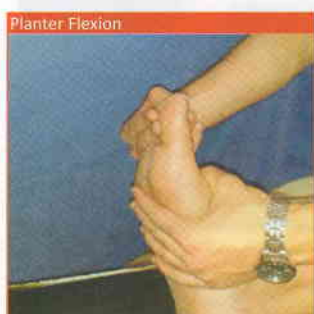


► Lower Limb Muscles Examination:

Root	Action	Muscle
L2	Flexor of the hip	Ileopsoas.
L3	Extensor of the knee	Quadriceps
L4	Dorsiflexion of the ankle	Anterior tibial group
L5	Dorsiflexion of the toes	Anterior tibial group & glutei
S1	Plantar flexion of the ankle and toes	Calf muscles & glutei
S2	Flexor of the knee	Hamstrings
S3,4,5	Anal contraction	Anal and perianal muscles

Hip

1. **Flexor:** ilio-psoas (L1,2) : ask the patient to flex his hip against resistance.
2. **Extensor:** gluteus maximus (L5, S1,2): with the patient lying face downwards in bed. Fix his trunk with your hands & ask him to raise his L.L. against resistance.
3. **Adductor:** adductors longus, brevis & magnus (L2,3,4) assisted by pectineus & gracilis. Abduct the thigh & ask the patient to bring it towards the midline.
4. **Abductors:** gluteus medius & minimus (L5, S1) while the thigh is in the midline. Ask the patient to move it outwards.

**Knee**

1. **Extensor:** quadriceps (L2,3,4): ask the patient to maintain knee extension while you try to bend the knee, or bend the patient's knee & ask him to straighten it.
2. **Flexor:** hamstrings (S1,2): ask the patient to pull his heel towards his buttock against resistance.

Ankle

1. **Dorsiflexor:** anterior tibial group (L4,5).
2. **Plantar flexor:** calf muscles (S1,2): the patient moves his foot upwards & downwards against resistance.
3. **Inversion:** tibialis anterior & posterior (L4).
4. **Eversion:** peroneal muscle (L5): the patient inverts & everts his foot against resistance.

5. Co-ordination:

Should be examine after power. Why?

Integration of

Cerebellum >> open eye.

Deep sensation and cerebellum >> closed eye.

Upper limb

1. Finger to nose.
2. Finger to finger.
3. Finger to doctor finger.
4. Finger to moving doctor finger.

Lower limb

1. Heel to knee.
2. Heel to doctor finger.

Findings:

- Intention tremor.
- Decomposition of movement.
- Dysmetria.

Types of Ataxia**Sensory**

Co-ordination is impaired only when the patient close his eyes.

Cerebellar

Co-ordination is impaired in both conditions; either the patient is opening or closing his eyes.

Mixed

Co-ordination is impaired in both conditions, but much worse when the patient close his eyes

Romberg's test:

Ask the patient to stand with the heels together, 1st with his eyes open, then with his eyes closed.

Note any swaying or loss of balance.

If present:

- Only with **closed** eyes = **sensory ataxia**.
- With eyes **open or closed** = **cerebellar ataxia or mixed**

Finger to finger



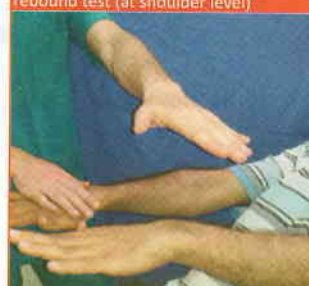
Finger to doctor's finger



rebound test (at elbow level)



rebound test (at shoulder level)



Heel to knee test

**► N.B.**

In rebound test doctors should remove his watch and patient should remove his glasses to avoid patient injury.

**6. Reflexes Examination:****Reflexes Examination****Superficial reflexes**

- Planter
- abdominal
- cremastic
- anal
- gluteal

Deep reflexes**Upper Limb**

- Biceps C5,6.
- Brachioradialis C5,6.
- Triceps C6,7.

Lower Limb

- Knee L2,3,4.
- Ankle S1,2.

Pathological reflexes**Upper Limb**

- Supraspinatus C3,4.
- Finger flexion C8, T1.
- Hoffman's C8, T1.
- Wartenberg's C8, T1.

Lower Limb

- Patellar L2,3,4.
- Adductor L4.

1. Superficial reflexes:**1. Planter reflex (S1, 2 but mainly S1)**

Technique: normally, stroking the sole of the foot with a blunt object results in planter flexion of the toes.

Normal response: planter flexion.

Abnormally: dorsiflexion = positive Babinski = Extensor planter = up going reflex.

Causes of +ve Babinski :

- Δ tract lesion.
- Infant below 1 year.
- Deep sleep.
- Anesthesia & coma

Other methods to elicit planter reflexes:

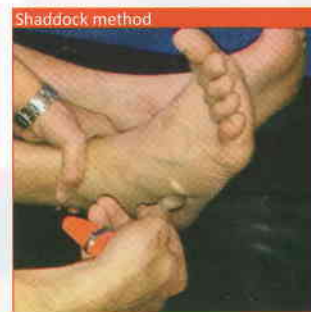
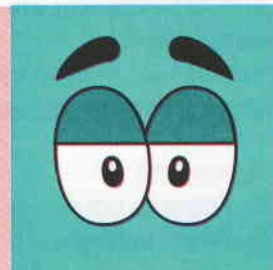
1. Strunski's method: sudden abduction of the little toe.
2. Gonda's method: the 3rd & 4th toes are passively flexed, then suddenly released.
3. Shaddock's method: a scratch is made on the lateral aspect of the dorsum of the foot from the lateral malleolus to the little toe.
4. Barda's method: a scratch is made on the dead lateral aspect of the foot.
5. Gordon's method: the calf muscles are firmly squeezed.
6. Schaefer's method: the tendon Achilles is firmly squeezed.
7. Oppenheim's method: firm pressure is applied on the skin over the lower part of the shaft of the tibia, from above downwards.

Causes of equivocal response:

1. L.M.N.L. at S1.
2. Hypothesis at S1.
3. Total paralysis of big toe.
4. Marked deformity of the foot.

► N.B.

In exam, the examiner observe your eyes, so you should look at the right place. This little body will tell you where you should look when electing the reflex

**► N.B.**

- There is **NOTHING** called **Negative Babinski**.
- Fanning of the toes on eliciting the reflex = **extra pyramidal lesion** specially area 6

Abdominal reflex (T6 - T12):**Technique:****Upper abdominal reflex (Th 6 - 10):**

light stroking of the skin of the abdomen above the umbilicus, from the periphery inwards, using a pin.

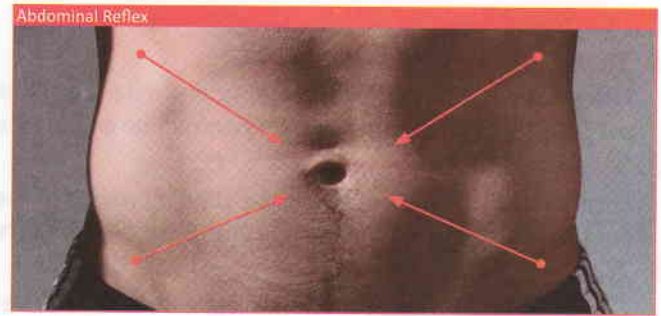
Lower abdominal reflex (Th 10 - 12):

light stroking is done below the level of the umbilicus, also from the periphery inwards.

In both cases, contraction of the ipsilateral abdominal muscles can be seen.

Value:

- In hemiplegia: ½ lost.
- In paraplegia: level.
- In D.S.: early lost.

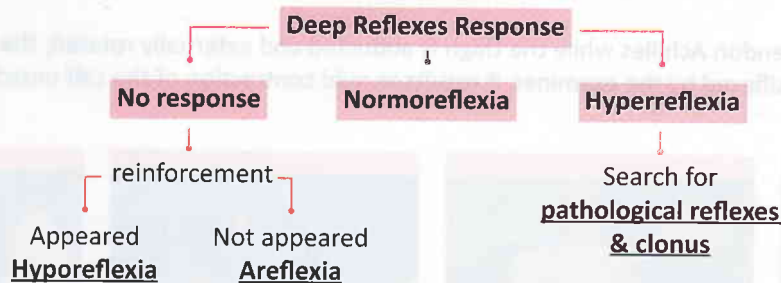


Abdominal Reflex

Cremasteric reflex (L1): elicited by a stroke with a pin, along the upper part of the medial aspect of the thigh resulting in visible contraction of the cremasteric muscle.

Gluteal reflex (L4,5): elicited by a stroking across one of the buttocks with a pin resulting in contraction of the ipsilateral gluteal muscles.

Anal reflex (S3,4,5): elicited by scratching the skin of the perineal region resulting in contraction of the external anal sphincter

2. Deep Reflexes:**Degree of reflexes:**

0	No reflex even by re-inforcement.
0/1	Reflexes obtained only by re-inforcement.
1	Normal hyporeflexia.
2	Exaggerated.
3	Brisk.
4	Clonus.

Causes of hyper-reflexia:

1. Δ tract lesion.
2. Thyrotoxicosis.
3. Tetany.
4. Tension.

► N.B.

Reflex is always as tone except in **parkinsonism** "hypertonia with hyporeflexia"

In the upper limb:**1. Biceps reflex (C5,6):**

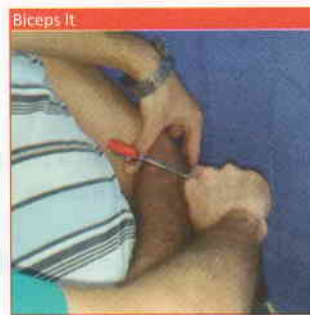
Elicited by a tap upon the biceps tendon while the elbow is at 120°. the tap is done on your index finger placed over the tendon. It results in mild contraction of the biceps with slight flexion of the elbow.

2. Brachioradialis (C5,6):

Elicited by a tap 3 - 4 cm above the styloid process of the radius. While the elbow is at 120°. it results in mild contraction of the brachioradialis and slight flexion of the elbow.

3. Triceps reflex (C6,7):

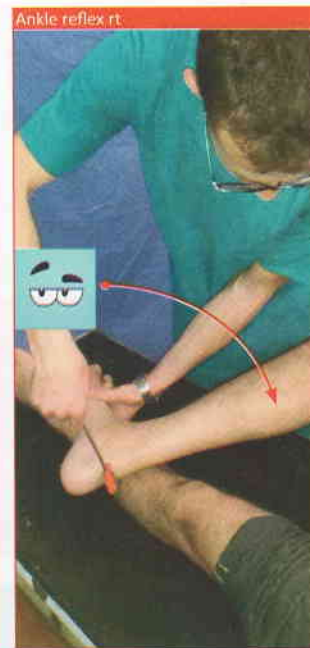
Elicited by a tap directly on the triceps tendon while the elbow is flexed at 90°. It results in mild contraction of the triceps with slight extension of the elbow.

**In the lower limb:****1. Knee reflex (L2,3,4):**

Elicited by a tap on the quadriceps tendon while the hip joint is slightly flexed and the knee joint is flexed and supported from beneath by your hand. It results in visible contraction of the quadriceps and extension of the knee.

2. Ankle reflex (S1,2):

Elicited by a tap on the tendon Achilles while the thigh is abducted and externally rotated, the knee is flexed at 90° and the ankle is dorsiflexed by the examiner. It results in mild contraction of the calf muscles with plantar flexion of the ankle.



3. Pathological Reflexes:**In the upper limb:****1. The supraspinatus reflex (C3,4):**

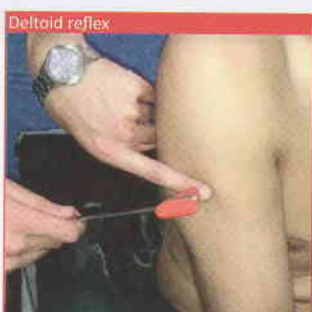
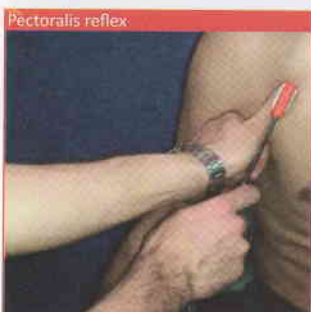
is done by tapping the supraspinatus muscle, in U.M.N.L. there is visible contraction of the muscles with slight abduction of the shoulder.

2. The finger flexion reflex (C8,T1):

is done by tapping the palmar surface of the middle 3 finger while they are slightly flexed, in U.M.N.L. there is prompt flexion of the finger.

3. Hoffman (C8,T1):

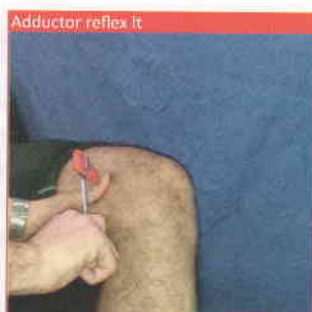
is done by tapping the nail or flicking the terminal phalanx of the middle or ring finger. in U.M.N.L. there is flexion of the terminal phalanx of the thumb.

4. Wartenburge sign (C8,T1)**5. Pectoralis (C3&4)****6. Deltoid (C4&5)****In the lower limb:****1. The patellar reflex (L2,3,4):**

is done by pressing the upper border of the patella downwards with the examiner's index finger and then tapping the finger with the hammer, in U.M.N.L. there is contraction of the quadriceps and displacement of the patella.

2. The adductor reflex (L4):

is done by tapping the index finger placed just above the adductor tubercle, while the hip is externally and slightly abducted, in U.M.N.L. there is visible contraction of the adductors with adduction of the thigh.



► **Clonus:**

Rhythmic contraction of the muscle after sudden sustained stretch of its tendon.

1. Organic: denoting a definite U.M.N.L. in which case. It stops with release of the stretch of the muscle.
2. Hysterical: where it persists in spite of release of the stretch of the muscle.

- **Upper limb clonus:**

- Wrist clonus C8, T1.

- **Lower limb clonus:**

- Patellar clonus L2,3,4.
- Ankle clonus S1,2.

- **Wrist clonus:**

is obtained by sudden and sustained extension of the wrist.

- **Patellar clonus:**

is obtained by holding the patella and displacing it slightly upwards, this is followed by a sudden downward displacement of the patella.

- **Ankle clonus:**

is obtained by passive planter flexion of the joint followed by sudden dorsiflexion.

► **N.B.**

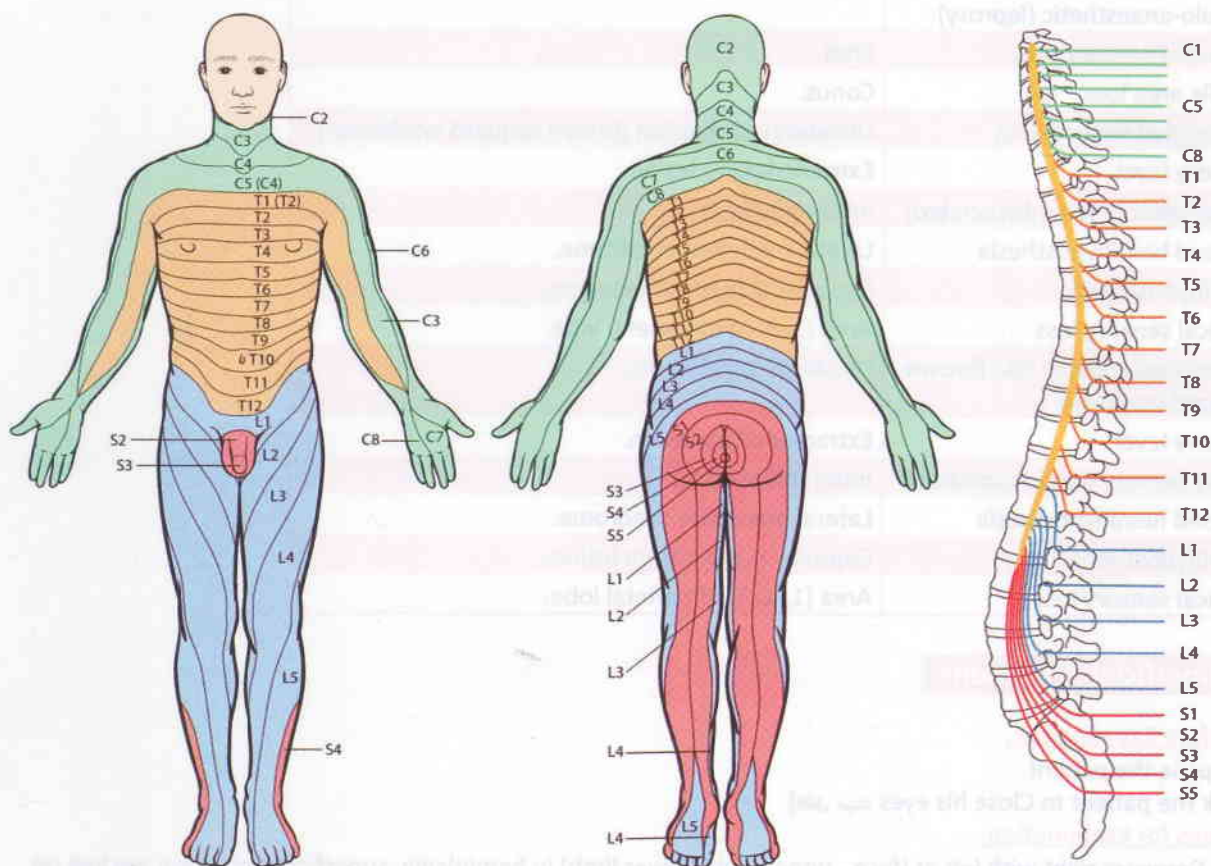
Sure signs of Δ tract lesion:

- Distribution of weakness.
- Hypertonia.
- Hyper reflexia.
- Positive Babinski.
- Pathological reflexes.
- Clonus (organic).

7. Sensory Examination:



► Dermatomes:



C2	Angle of jaw, lateral neck.
C3, 4	Shoulder, down manubrium.
C5	Lateral aspect of arm.
C6	Lateral aspect of the forearm, thenar eminence & thumb.
C7	Middle aspect of the forearm, middle of the palm, middle 3 fingers.
C8	Medial aspect of forearm, hypothenar eminence & little finger.
T1	Medial aspect of arm.
T2 - T7	Thorax (T4 is at nipples).
T8 - T12	Abdomen (T10 is at umbilicus). (T12 is at inguinal ligament).
L1	Upper 1/3 front of thigh.
L2	Middle 1/3 front of thigh.
L3	Lower 1/3 front thigh.
L4	Anterolateral aspect of thigh, front of knee, anteromedial aspect of leg, medial aspect of foot & big toe.
L5	Lateral aspect of thigh, lateral aspect of leg, middle 1/3 of dorsum of foot & middle 3 toes.
S1	Posterolateral aspect of thigh & leg, lateral 1/3 of dorsum of foot & little toe.
S2	Posterior aspect of thigh, leg & sole of the foot.
S3,4,5	Anal, perianal & gluteal region (saddle shaped area) in concentric manner.

► Site of lesion in each pattern of sensory loss:

Pattern of sensory loss	Site of lesion
Mononeural. Stock & glove. Maculo-anaesthetic (leprosy).	Peripheral nerve.
Radicular sensory loss.	Root.
Saddle area loss.	Conus.
Dissociated sensory loss	Unilateral cord lesion (brown sequard syndrome)
Sensory level.	Extramedullary lesion.
Jacket sensory loss (dissociated)	Intramedullary.
Crossed hemihyposthesia	Lateral medullary syndrome.
Hemihyposthesia	Capsular & brain stem lesion.
Cortical sensory loss	Area (1, 2, 3) of parietal lobe.
Dissociated sensory loss (brown sequard syndrome)	Unilateral cord lesion.
Sensory level	Extramedullary lesion.
Jacket sensory loss (dissociated)	Intramedullary.
Crossed hemihyposthesia	Lateral medullary syndrome.
Hemihyposthesia	Capsular & brain stem lesion.
Cortical sensory loss	Area (1, 2, 3) of parietal lobe.

1. Superficial Sensations:

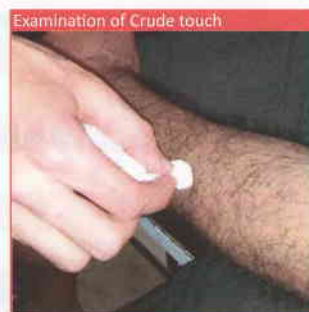
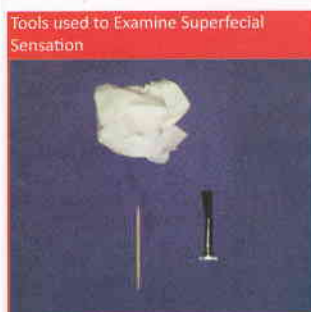
Before Examination:

Expose the patient

ask the patient to Close his eyes (اقفل عينك)

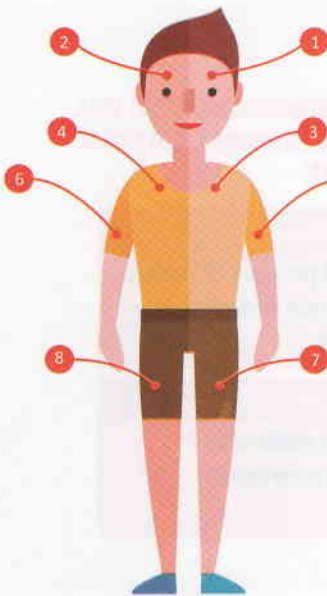
Steps for Examination:

1. Compare right with left at (face - upper limb - lower limb) in hemiplegia; superficial sensation are lost on one side
2. Compare the same side at (face - upper limb - trunk - lower limb)
 - Jacket of sensory loss in intramedullary compression paraplegia.
 - Decrease sensation in both lower limb in extramedullary Compression paraplegia.
3. Compare proximal with distal (P.N.).
4. Level (P.N.).
5. Circumferential. (check distrubtion of dermatomes)

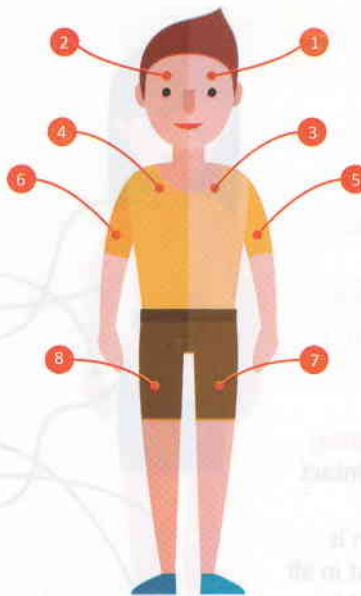


► N.B.

Superficial Sensations: are pain, touch and temprature assend in anterior spinothalamic tract except fine touch ascends with deep sensation in posterior column pathway.

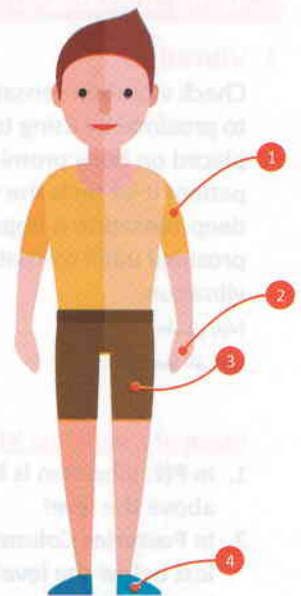


- Face Rt and Lt
حاسس هئا 1 زی هئا 2
- Trunk Rt and Lt
حاسس هئا 3 زی هئا 4
- Upper Limb Rt and Lt
حاسس هئا 5 زی هئا 6
- Lower Limb Rt and Lt
حاسس هئا 7 زی هئا 8



All the left side:
Face, Trunk, UL and LL
حاسس هئا 1 زی هئا 3 زی هئا 5 زی هئا 7

Then all the right side:
Face, Trunk, UL and LL
حاسس هئا 2 زی هئا 4 زی هئا 6 زی هئا 8



- In both sides:
- UL proximal and distal (so proximal and so distal)
حاسس هئا 1 زی هئا 2
If proximal is better do the next steps to determine the level
 - LL proximal and distal (so proximal and so distal)
حاسس هئا 3 زی هئا 4
If proximal is better do the next steps to determine the level



Determine the level (P.N.). in both
UL and LL

هشکک واما الاحساس یزید او یتغیر قوی



Go circular to (DD roots affection
= not all dermatomes affected)

زی بعضه؟

2. Deep Sensations:

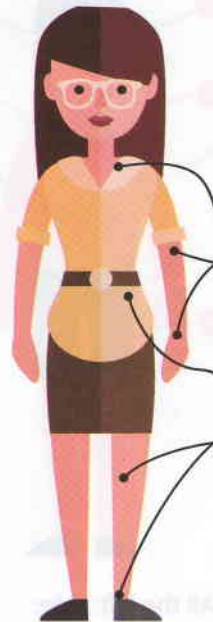
1. Vibration:

Check vibration sensation from distal to proximal by using **tuning fork 128** placed on bony prominences. Ask the patient if he feels the vibration. If deep sensation is impaired distally go proximal until the patient feels the vibration.

حساس بايه؟
ما تحسها تاني قوي

Value of Examining Vibration in Neurology:

1. In **PN**: Vibration is lost distally and is intact above the level.
2. In **Posterior Column injury**: Vibration is lost below the level of injury (e.g. lost in all lower limb and intact in all upper limb)
3. In **thalamic lesion**: Vibration is lost in all body even in forehead



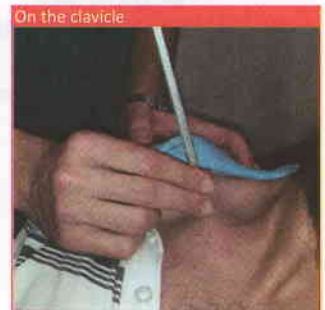
The bony prominences that you should use arranged from distal to proximal:

Upper limb

1. Styloid process of radius
2. Olecranon process
3. Clavicle

Lower limb

1. Medial malleolus
2. Tibial tuberosity
3. ASIS



2. Muscle Sensation:

Squeeze the calf muscle while the patient is closing his eyes and ask the patient if he can recognise the sensation.

Loss of muscle sense called **abadie's sign** as in diabetic P.N.



► N.B.

Tender calf muscle in:

- Diabetic P.N.
- G.B.
- Nutritional P.N.
- D.V.T.
- Myositis.

3. Position & movement: (joints sense):

first show the patient with his eyes open, the position of his big toe (dorsi-flexed), then with his eyes closed, move the big toe and ask him if he feels it moving and if so in which direction.

The big toe should be caught gently, from the sides and should not touch the other toes during movement.

4. Nerve sense:

By pressing the ulnar nerve and the lateral popliteal nerve against the bones. Normally, it results in an electric like sensation.

**3. Cortical Sensations:**

They are only examined when the superficial and deep sensation are intact.

1. Tactile localization:

ask the patient to close his eyes, then prick his finger & ask him to localize the site of the prick.

2. Two-points discrimination:

with the patient's eyes closed, deliver 2 simultaneous pricks, e.g. on the finger (5mm apart) or on the legs (4cm apart). Normally the 2 pricks are felt distinct from each other.

3. Stereognosis:

with his eyes closed, the patient is asked to recognize a familiar object placed in his hand.

4. Graphosthesia:

with his eyes closed, the patient is asked to recognize a number or letter drawn over his palm.

5. Perceptual rivalry:

normally if you deliver 2 simultaneous pin pricks at 2 corresponding sites of the body, both pricks are felt; in cortical sensory loss, only the prick on the healthy side is felt.



Tactile localization then 2 points discrimination

شکیتک فین؟
شکه واحده ولا اتین؟



8. Back and Cranium:

Back Examination for:

- Scar.
- Deformity.
While the patient is standing then sitting to observe lumbar lordosis.
- Tenderness.
- Café au lait patches "neurofibroma".
- Tuft of hair in spina bifida.

Cranium Examination for:

- Size, shape, sutures & fontanelles.
- Bony bosses & tenderness.
- Dilated veins, bruits & naevi.
- Mc Ewen's sign in brain tumor.

► N.B.

To count the vertebrae from the back.

- The most prominent bone in back at C7.
- The angle of the scapula at T7.



9. Gait:

1. Hemiplegia: **circumduction**.
2. Paraplegia: **scissoring**.
3. P.N.: **high stepping**.
4. Sensory ataxia: **stamping**.
5. Friedreich's ataxia (archicerebellum): **drunken**.
6. Marie's ataxia (Neo cerebellum):
 - Unilateral: **deviation to one side**.
 - Bilateral: **Zigzag**.

7. Parkinsonism:

- **Short steppage**.
- **Shuffling**.
- **Festinant**.

8. Chorea: **dancing**.

9. Myopathy: **waddling**



circumduction



scissoring



shuffling



high step gait



waddling

10. Other systems:

Rapid Examination of the other systems

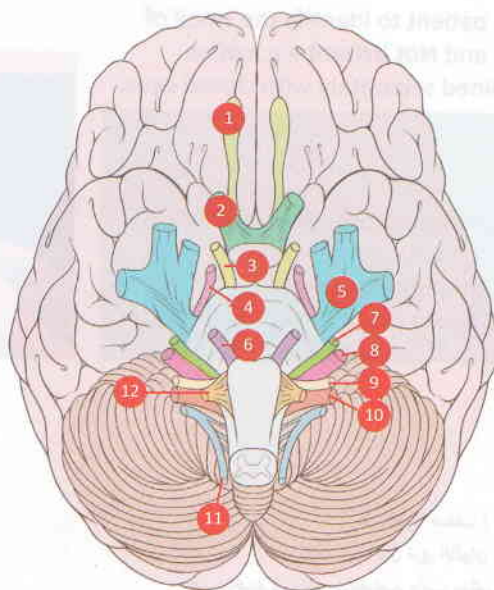
CRANIAL NERVES INTRODUCTION

Cranial Nerves:

1. Olfactory nerve (I)
2. Optic nerve (II)
3. Oculomotor (III)
4. Trochlear (IV)
5. Abducent (VI)
6. Trigeminal V
7. Facial (VII)
8. Vestibulocochlear (VIII)
9. Glossopharyngeal (IX)
10. Vagus (X)
11. Accessory (XI)
12. Hypoglossal (XII)

Group:

- oculo cranial (III IV VI)
- bulbo cranial (IX X XI)

**Cranial Nerves****Special Senses**

I, II, VII

Mixed

V, VII, X

Motor

- III, IV, VI
- XI, XII

► N.B.

All cranial nerves have bilateral Δ tract supply **Except :**

1. **Lower facial nucleus.**
2. **Hypoglossal XII "50%".**
3. **Spinal part of XI.**

Which are supplied from the opposite side only, so these nerves are affected in unilateral lesion as hemiplegia.

CRANIAL NERVES HISTORY AND EXAMINATION

Assessment of Cranial Nerves**History.****Examination****Inspection.****Power.****Sensation.****Reflexes.****► N.B.**

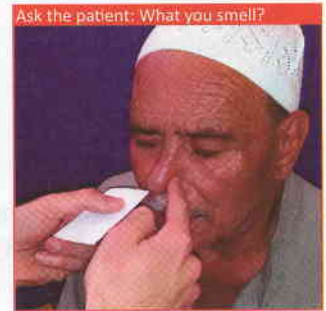
- In children and infants: Examine cranial Nerves as possible regarding the compliance and age.
- **Oral discussion in clinical examination**
 - Anatomy.
 - Physiology "function".
 - Examination "technique".

I. Olfactory nerve:**History:** هل حاسة الشم اتغيرت ؟**Examination:**

Ask the closed eyes patient to identify the smell of substance: **Familiar** and **Not irritant** e.g. coffee.
Each nostril is examined separately with closed eyes.

► N.B.**Anosmia**

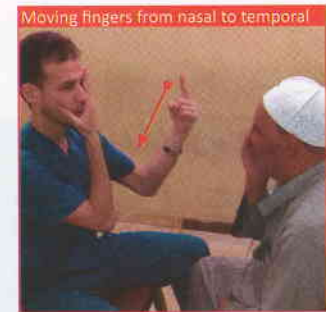
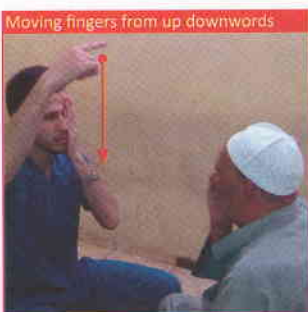
- Unilateral: neurological disease as fracture base of the skull, meningitis or olfactory bulb tumor "**Foster Kennedy syndrome**".
- Bilateral: E.N.T. cause

**II. Optic nerve:****History:**

1. Acuity of vision ؟ هل نظرك ضعيف
2. Colored vision ؟ هل ترى الألوان ؟
3. Field of vision ؟ هل بتخبط في الناس والعواميد وأنت ماشي ؟

Examination:

1. **Acuity of vision:** using Snellen's chart or finger counting from a distance of 6 meters. In case of failure to count the finger at this distance repeat at a shorter distance. If at a distance of 30 cm the patient still fails to count the finger test for vision use hand movements. If the patient does not see the movements, test for light perception using the torch. If there is no P.L. (perception of light) then the patient is blind. Each eye should be examined separately.
2. **Colored vision:** See ophthalmology.
3. **Field of vision: the confrontation test:**
 - Sit in front of the patient at a distance of 60 - 100 cm. keep your eyes at the level of the patient's eyes.
 - Let the patient close one eye and you close the opposite eye. Insist that the patient looks into your eye and nowhere else.
 - Examine for the field of vision of the patient's open eye by bringing your finger slowly from the periphery inwards. Test for the whole field by bringing your finger from above, below, left and right.
 - Move the fingers till the end to insure there's no scotoma
 - move fingers upside down and ask the patient if he can see it moving.
 - Compare the visual field of the patient to your own visual field (normal).



Reflexes:**1. Light reflex "afferent: 2nd".**

Separate the eyes by your hand, move the torch from lateral to medial. look for miosis in:

- the same eye: direct reflex
- the other eye: consensual reflex

2. Accommodation reflex "efferent: 3rd".

Ask the patient to follow your finger by his eyes while moving it towards his nose.

Normal response:

- Convergence.
- Miosis.
- Accommodation.

Significance

Argyll Robertson pupil: Small, irregular, unequal which doesn't react to light but reacts to accommodation.

Causes:

- D.M.
- Neurosyphilis.
- D.S.
- Encephalitis.

**III, IV & VI Oculo cranial nerves: Oculomotor, Trochlear, Abducent:****Introduction**

Muscles of the eye: Extra ocular muscles and Intra ocular muscles.

Extra ocular muscles:

1. Superior rectus
2. Inferior rectus. (III Oculomotor)
3. Medial rectus
4. Lateral rectus (VI Abducent)
5. Superior oblique (IV Trochlear)
6. Inferior oblique (III Oculomotor)

History

- Ptosis هل جفنك سقط ؟
- Squint هل عينك أحولت ؟
- Diplopia هل بتشوف الحاجة اتنين ؟

Examination:**Inspection:****1. Ptosis:** which may be due to:

- Oculomotor nerve paralysis where the ptosis is complete and there is associated mydriasis and divergent squint.
- Sympathetic paralysis "Horner's syndrome" where the ptosis is partial and there is associated miosis, enophthalmos and anhydrosis.

2. Squint.**3. Pupils:** they should be equal, round and reactive to light (RRR).

- **The light reflex:** see above
- **The accommodation (near) reflex:** see above
- **Cilio-spinal reflex:**

pinching the skin on one side of the neck results in dilatation of the ipsilateral pupil. This reflex is absent in cervical sympathetic lesion "Horner's syndrome".

4. Nystagmus. See below**Intra ocular muscles:**

1. Dilator pupillae: sympathetic supply.
2. Constrictor pupillae: (III Oculomotor)
3. Ciliary muscles: (III Oculomotor)

► N.B.

All muscles of the eye are supplied by

III Oculomotor except 3 muscles:

1. Superior oblique by IV trochlear **SO4**
2. Lateral rectus by VI abducent **LR6**
3. Muller Muscles: sympathetic supply.



Power:**1. Each eye separately:**

The patient close the other eye & the examiner fix the patient head.

III (Oculomotor):

Superior rectus عيناك ل فوق

Inferior rectus عيناك ل تحت

Medial rectus عيناك ل جوه

VI (Abducent): lateral rectus عيناك ل بره

IV(): superior oblique عيناك ل كتفك

2. Both eyes together:

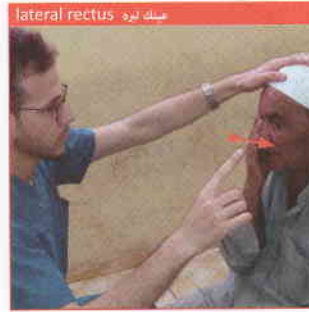
The examiner also fix the patient head. If both eyes are normal to examine the conjugate eye movements:

عيناك الأثنين ل فوق

عيناك الأثنين ل تحت

عيناك الأثنين ل ليمين

عيناك الأثنين ل لشمال

**Significance:**

In ophthalmoplegia internuclearis in median longitudinal bundle (M.L.B.) lesion that may occur with multiple sclerosis.

► Nystagmus:

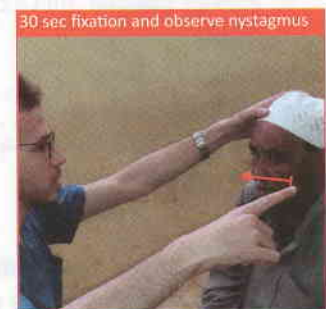
Definition: Oscillatory movement of the eye ball.

Character of nystagmus in cerebellar lesion:

1. On fixation.
2. Horizontal.
3. Biphasic (jerky).
4. Rapid phase toward the fixation point.
5. Bilateral.

Examination of Nystagmus:

Ask the patient to fix his eyes looking at your finger twice right side and left side (both eyes together). observe if there's any oscillatory movement of each eye.

**V. Trigeminal:**

It is mixed cranial nerve:

- **Motor:** muscles of mastication.
- **Sensory:** the main for the face, except skin overlying angle of the mandible which is supplied by C2.

Anatomy

the trigeminal nucleus lies in the upper part of the pons which bilateral Δ supply and 3 sensory nuclei in the brain stem (see written notes).

History

- **Motor:** هل يوجد صعوبة في المضغ ؟
- **Sensory:** هل يوجد وجع أو شكشة أو تنميل في وجهك ؟
هل الإحساس في وجهك قل أو اختفى ؟

Inspection:

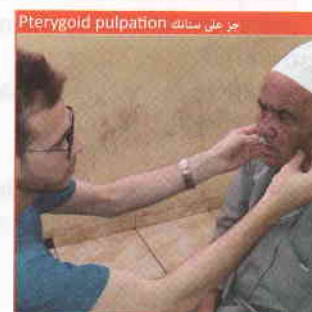
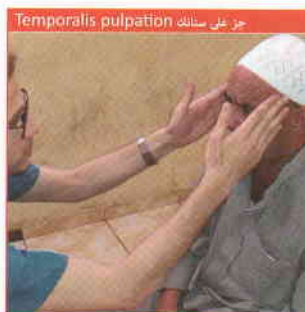
Wasting above or below zygoma.

- Above: **temporalis**.
- Below: **masseter**.

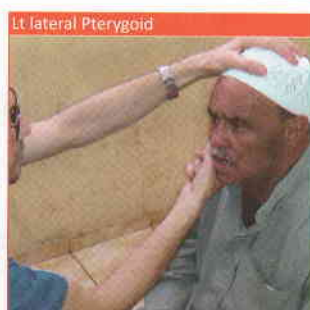
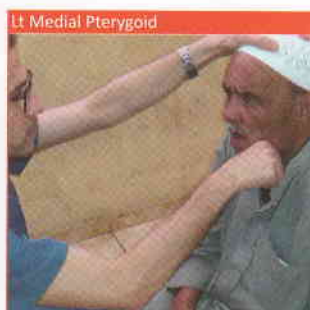
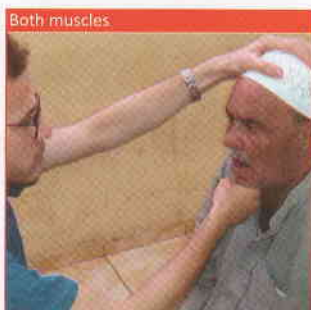
Power:

Muscles of mastication.

- **Temporalis & masseter:** جز على سنائك
To touch the temporalis & catch the masseter.
- **Pterygoids:** Ask the patient to open his mouth

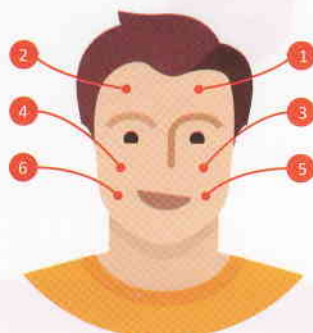


Not deviated		Deviated
Normal	Bilateral weakness	The same side of the lesion
Examine against resistance	But the mouth is opened by gravity (D.D. between bilateral UMNL and LMNL by reflexes)	
• Both together. • Each one separately.		



Sensation: 3 steps (اقفل عينك Close your eyes)

1. Compare between each corresponding parts (affection of sensation in one side occurs in hemiplegia).
2. Compare the 3 parts at the same side with the area supplied by C2.
 - Value : compare face with body sensation
3. Compare central part with peripheral, upper with lower part of the face.
 - Value: to detect the site of the lesion in the nucleus.



Ophthalmic division Rt and Lt

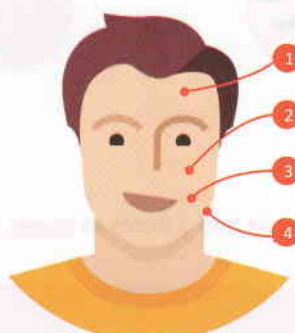
حاسس هنا 1 زي هنا 2

Maxillary division Rt and Lt

حاسس هنا 3 زي هنا 4

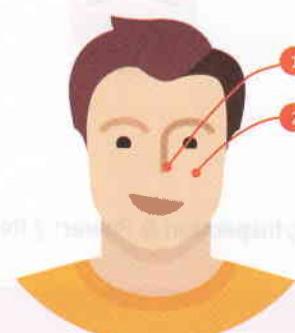
Mandibular division Rt and Lt

حاسس هنا 5 زي هنا 6



Compare whole side with c2

حاسس هنا 1 زي هنا 2 زي هنا 3 زي هنا 4



Compare central and Peripheral

حاسس هنا 1 زي هنا 2

Reflexes:

1. Jaw reflex "afferent: 5th" "efferent: 5th"
(Pathological reflex)

(temporalis masseter reflex)

place your thumb on the mentum and gently tap over it.

Significance: Accurate Anatomical Diagnosis

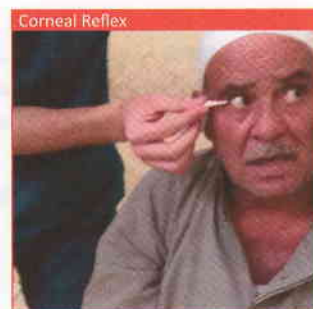
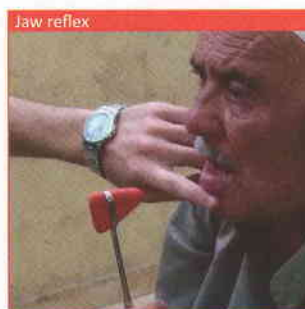
- Bilateral.
- UMNL.
- Above the pons. (leveling reflex).

2. Corneal reflex "afferent 5th" "efferent 7th in both sides" (Normal reflex)

Significance: Absent in:

- Brain death.
- Deep coma.
- G.A.

3. Palatal reflex "afferent 5th" "efferent 10th"

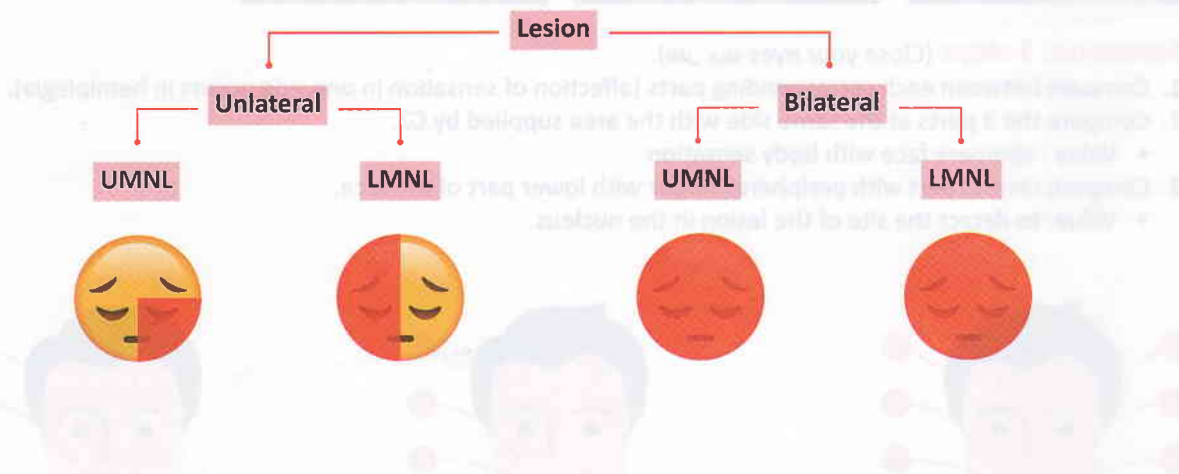
**VII. Facial:**

It is mixed Cranial nerve:

- **Motor:** the main for the face.
- **Sensory:** taste sensation from the anterior 2/3 of the tongue.

Anatomy:

- The nucleus lies in the pons.
- Its upper half is bilaterally supplied by Δ tract.
- Its lower half is unilaterally supplied by Δ tract from the opposite side only.



History, Inspection & Power: **2** items in **upper part** and **3** items in **lower part**

History	Inspection	Power
1. هل الصابون بيدخل عينك ؟ 2. هل عينك بتدمع زيادة ؟	1. Wrinkles "frontalis" 2. Blinking.	1. ارفع حواجبك 2. اقفل عينك جامد
1. هل الأكل بيتجمع في فمك ؟ 2. هل ريقك بينزل ؟ 3. هل إتعوج فمك ؟	1. Nasolabial fold. 2. Dripping of saliva. 3. Mouth deviation.	1. انفخ فمك Orbicularis oris 2. صقر Orbicularis oris 3. وريني أسنانك Retractor anguli



Crease up the forehead



Keep eyes closed against



Reveal the teeth



Puff out the cheeks

Reflexes:

1. Glabellar reflex "afferent: 7th" "efferent: 7th"

Gently tap by the hammer between eye brows

Normally: blinking 4 - 6 times, then stopped due to habituation.

Significance: Accurate Anatomical Diagnosis

- Present: UMNL (exaggerated).
- Absent: LMNL.
- Persistent (no habituation): parkinsonism.

2. Corneal reflex "afferent 5th" "efferent 7th in both sides"

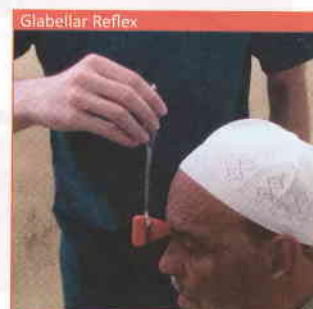
See before

Significance: Absent in:

- Brain death.
- Deep coma.
- G.A.

Sensation:

Taste sensation for the anterior 2/3 of the tongue.



VIII. Vestibulocochlear:

History:

هل يوجد مشاكل في السمع والإتزان ؟

Examination:

A. Cochlear part: test for the acuity of hearing using:

- **The watch test:** if there is diminution of the patient's hearing do the following:
 - **Rinne's test:** using the vibrating fork, compare air conduction (fork placed in front of patient's ear) with bone conduction (fork placed on patients mastoid process).
 - **Weber's test:** place the tuning fork in the middle of the forehead.



	Watch test	Rinne's test	Weber's test
Normal	The acuity of the patient's hearing is similar to that of the examiner.	Air conduction is better than bone conduction.	The vibrations are heard in the middle of the forehead.
Nerve deafness	The patient's hearing is less than that of the examiner's	Both air and bone conduction are diminished.	The vibrations are heard in the normal ear.
Conductive deafness	The patient's hearing is less than that of the examiner's.	Bone conduction is better than air conduction.	The vibrations are heard in the affected ear.

B. Vestibular part:

Caloric test, rotating chair tests and electronystagmography (E.N.T.).

IX, X & XI Bulbar cranial nerves: Glossopharyngeal, Vagus and Cranial part of Accessory:

They supply the palate, pharynx & larynx

History:

Palate 2	هل صوتك اخف ؟ هل الماء يرجع من أنفك ؟
Pharynx 2	هل يوجد صعوبة في البلع ؟ هل بتشرق كثير ؟؟؟
Larynx 2	هل صوتك اتبجح ؟؟؟ هل يوجد صعوبة في الكلام ؟

Power:

By using a tongue depressor and ask the patient to say ah & observe the uvula.

Slightly elevated upward (base of the uvula)	Deviated to the healthy side	No movement
Normal	Unilateral lesion	UMNL or LMNL D.D. by reflexes.

Reflexes:

1. **Palatal reflex** "Afferent: 5th" "Efferent: 10th"

2. **Pharyngeal reflex (gag reflex)** "Afferent 9th" "Efferent: 10th".

Value:

Normal	LMNL	UMNL
Slightly elevated uvula.	No movement at all.	- The uvula rapidly jumped upward. - Gagging. - Vomiting.

Inspecting the uvula, eliciting palatal reflex and pharyngeal reflex.

**► N.B.**

Bilateral LMNL: **true** bulbar palsy.

Bilateral UMNL: **pseudo** bulbar palsy.

XI. The Spinal Part Of Accessory:

It supplies sternomastoid & trapezius.

History: هل كتفك سقط ؟

Examination:

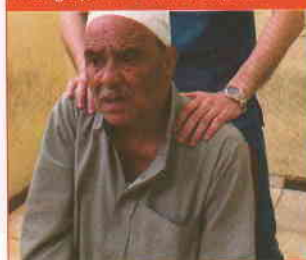
Movement against resistance:

Trapezius from behind the patient: ارفع كتفك

Sternomastoid muscles: ask the patient to push against you by his chin and feel the sternomastoid on the other side زق على ايدي

Examining trapezius power

Findings: paresis of the lt trapezius



sternomastoid



XII. Hypoglossal:

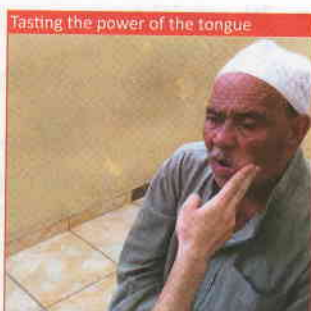
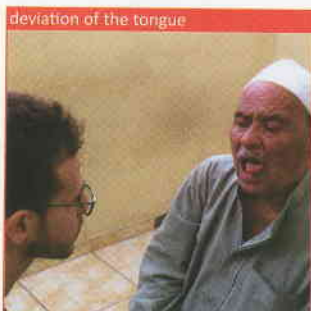
It is a purely motor for the tongue

History: هل لسانك إتعوج ؟

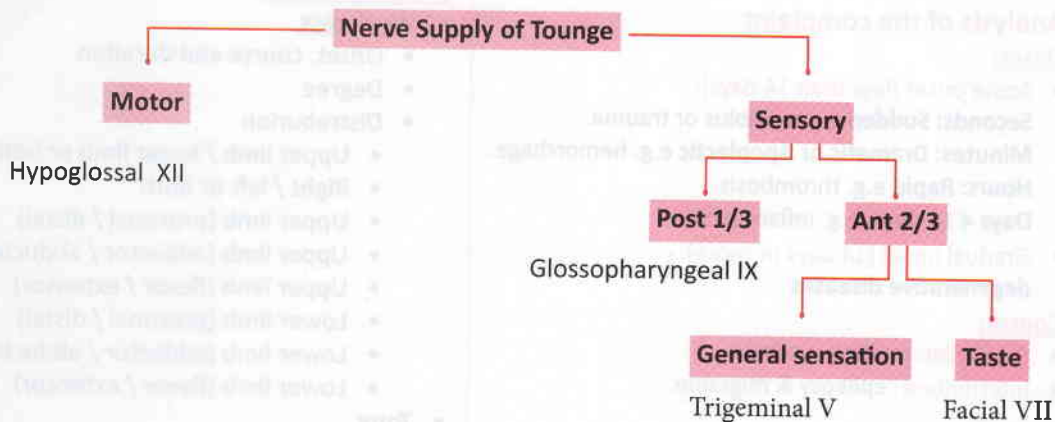
Inspection: Look for wasting and fasciculations

Power: طلع لسانك بره

Deviated The diseased side	Central	
	Normal do against resistance	Bilateral affection
		UMNL LMNL
		No wasting Wasting

**► N.B.****Tongue:**

1. **Parkinsonism** (tremors).
2. **Chorea** (jerky movement).
3. **Myotonia** (dimple sign).



SUMMARY OF NEUROLOGY SHEET

*Don't get lost; Unlike most of this book, the following summary is organized in 2 columns...

Personal history:

- Name
- Age
- sex
- Occupation
- Marital status
- Residence
- Special habits
- Handedness

Complaint:

Patient own words + duration

History of present illness:

1. Analysis of complaint.
2. Symptoms of the related system.
3. Other systems.
4. Investigation & treatment (related diseases)
5. DM & HRT

1. Analysis of the complaint• **Onset:**

- **Acute onset (less than 14 days):**

Seconds: Sudden e.g. embolus or trauma.

Minutes: Dramatic or Apoplectic e.g. hemorrhage.

Hours: Rapid e.g. thrombosis.

Days < 14 days: e.g. inflammation.

- **Gradual onset (14 days or more):** degenerative diseases

• **Course:**

- **Remittent:** multiple sclerosis.
- **Intermittent:** epilepsy & migraine.

2. Symptoms of C.N.S.

(T.N.M + 4 Ss + Hypothalamus)

1. Symptoms of increased intracranial tension. (I.C.T.).
2. Cranial nerves symptoms.
3. Motor system.
4. Sensory system.
5. Sphincter troubles.
6. Speech troubles.
7. Systemic Review
8. Hypothalamic Manifestations

1. Symptoms of increased intracranial tension. (I.C.T.).

- Headache
- Projectile vomiting
- Blurring of vision

2. Cranial nerves symptoms.

- **Olfactory:** anosmia
- **Optic :** (acuity - color vision - visual field)
- **3rd, 4th and 6th cranial nerves** (ptosis - squint - diplopia)
- **5th cranial nerve**
 - Motor
 - Sensory
- **7th cranial nerve**
 - Sensory
 - Motor (UMNL or LMNL)
- **8th cranial nerve** (deafness - tinnitus - vertigo)
- **9th and 10th cranial nerves** Palate, Pharynx and Larynx
- **11th cranial nerve**
- **Cranial part of accessory**
- **Spinal part of accessory**
- **12th cranial nerve**

3. Motor system.• **Weakness**

- Onset, course and duration
- Degree
- Disturbance
 - Upper limb / lower limb or both
 - Right / left or both
 - Upper limb (proximal / distal)
 - Upper limb (adductor / abductor)
 - Upper limb (flexor / extensor)
 - Lower limb (proximal / distal)
 - Lower limb (adductor / abductor)
 - Lower limb (flexor / extensor)

• **Tone**• **Wasting**• **Trophic changes**• **Fasciculation**• **Involuntary movement**

- Static / kinetic
- Regular / irregular
- Increased by / decreased by
- Proximal / distal
- Head, neck & Trunk

• **Co-ordination**

- Cerebellum
 - Upper limb: shaking / tremors .
 - Lower limb: drunken gait.
- Deep sensation
 - Lower limb: falling on closing both eyes

4. Sensory system.

• Superficial (pain - touch - temperature)

- Onset + course + duration
- Irritation: pain / parasthesia
- Destruction: hyposthesia / anaesthesia.
- Distribution: Sites & sensory level

• Deep sensation

• Cortical sensation

5. Sphincter troubles.

(Micturation - Defecation - sexual function)

6. Speech troubles.

7. Systemic Review.

- CVS
- Respiratory

8. Hypothalamic Manifestations

3. Other systems (Systemic Review) e.g. CVS and

Resp.

4. Investigation & treatment (related diseases)

patient investigated by CT, MRI, MRI with diffusion

and treated by clexan etc...

5. DM & HTN

Past history:

- Similar attacks
- Chronic diseases as D.M., hypertension and T.B.
 - Diabetes Mellitus:
 - Hypertension:
 - T.B.:
 - Hepatitis
 - D.V.T
- Trauma.
- Major operations. (complications of general or spinal anaesthesia).
- blood transfusion
- Fevers
- Drug allergy and intake

Family history:

Similar condition

PARAPLEGIA

Definition: Paralysis or weakness of both lower limbs below the level of C5 ,

It may be due to:  Δ tract lesion (**spastic**).
LMNL (**flaccid**).

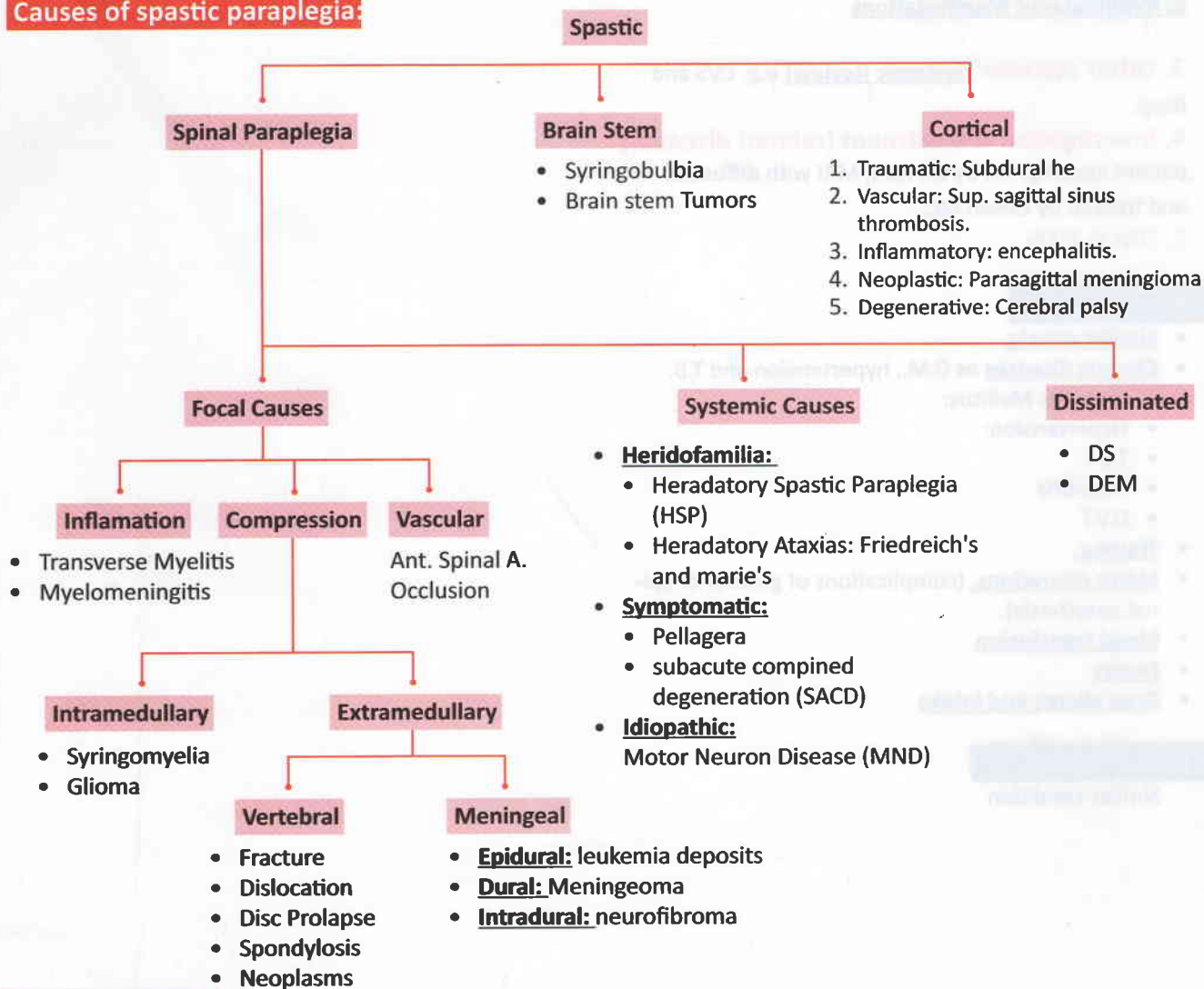
Causes of flaccid paraplegia:

- Shock stage.
- Cauda equina lesion.
- Bilateral poliomyelitis.
- Severe myopathy.
- Subacute combined degeneration.
- Ferdrich's ataxia.

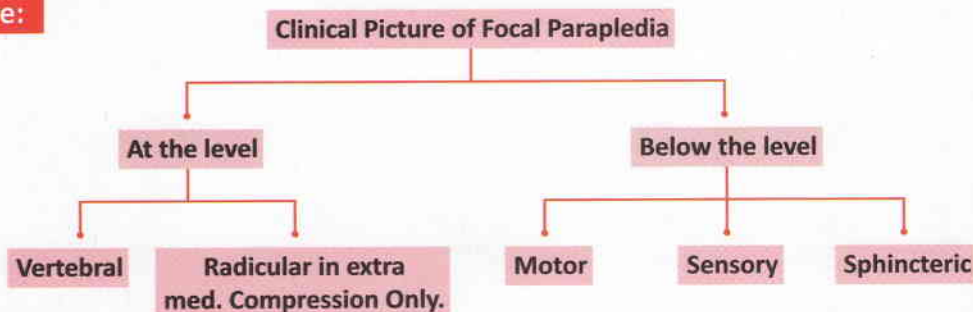
Spastic Paraplegia:

Paralysis or weakness of both lower limbs due to bilateral pyramidal tract lesion most commonly in the spinal cord (Spinal Paraplegia) and less commonly in brain stem or cerebral parasagittal region (Cerebral Paraplegia)

Causes of spastic paraplegia:



Clinical Picture:



At the level of the lesion:

- **Vertebral manifestation (in vertebral causes):**
Localized pain or tenderness
Localized swelling
- **Radicular manifestation (in extrapyramidal compression only)**
 - **Posterior root affection**
girdle pain then hypoesthesia and anesthesia of the affected dermatome
 - **Anterior root affection:**
localized LMNL in the muscles supplied by the affected root

► N.B.

- in paraplegia below cervical segments the LMNL is not clinically detected
- in lesion above the cervical region, there's quadriplegia with evidence of LMNL in the UL

below the level of the lesion:**1. Motor manifestation:**

- **acute causes** e.g. inflammatory, vascular or traumatic
the paraplegia passes by 2 stages:
 1. **shock stage** (flaccid paralysis) immediately following the cause and last for 2 : 6 weeks
 2. **recovery stage** (spastic paralysis)
- **gradual causes** e.g. neoplastic
the shock stage is **absent**.

paraplegia in extension:

the weakness affects distal more than proximal and flexors (pro gravity) more than extensors (anti gravity)
the hypertonia affects extensors (anti gravity) more than flexors (pro gravity)

paraplegia in flexion:

progression of the lesion to the extra pyramidal fibers; the hyper tonia will be in flexors more than extensors

this last stage maybe associated with the **mass reflex**: spontaneous urination and defecation on scratching the inner side of the thigh

Pierre Marie foix :

Test is done by firm passive planter flexing of the toes and foot, this will result in spontaneous "withdrawal reflex" i.e. spontaneous flexion of the hip, knee and dorsiflexion of the ankle if the paraplegia is passing from extension to flexion.

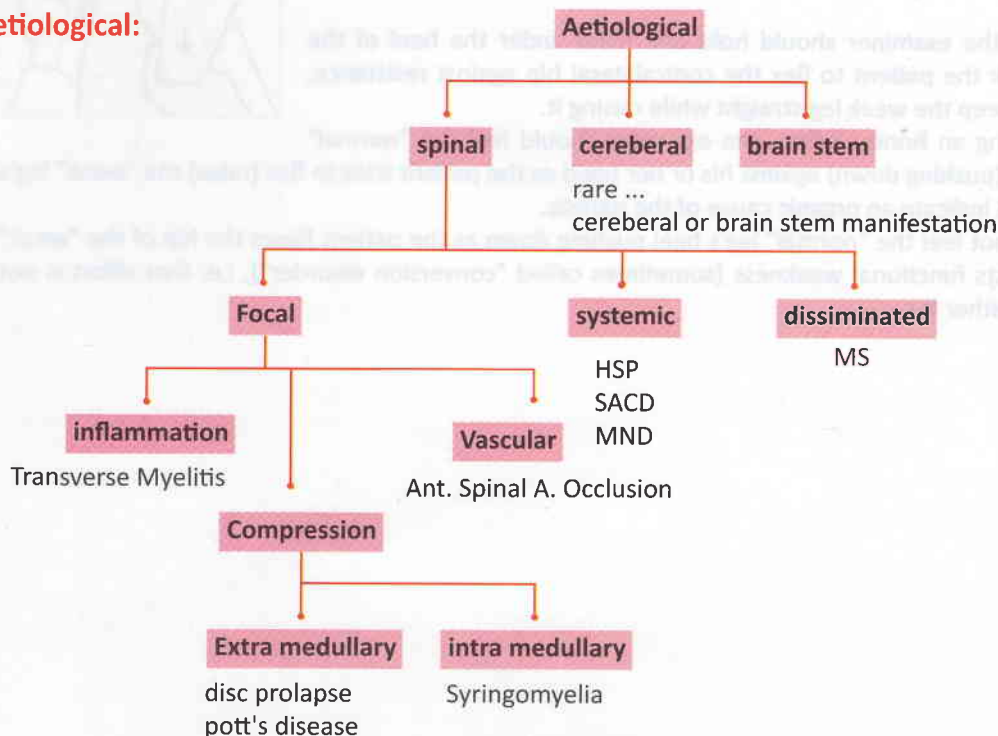
2. sensory manifestation:

- **extra medullary compression:**
sensory level below which all types of sensation are lost with early affection of saddle shaped area (s2,3&4)
- **intra medullary compression:**
jacket sensory loss of dissociated nature i.e. pain and temperature are lost but touch and deep sensation are preserved with sacral spare

3. sphincteric manifestation:

- **in acute lesion:** retention of urine in shock stage followed by pericpitanacy of urine
- **in gradual lesion:** perceptancy of urine which may terminate with automatic bladder
these changes start **early in intra medullary and late in extra medullary**

Dignosis: Aetiological, level, stage and organic or hysterical

Aetiological:

Intra medullary compression	Extra medullary compression
Painless onset.	Painful (girdle pain).
Symmetrical.	Asymmetrical.
Jacket sensory loss (Dissociated)	Sensory level (usually associated).
Early sphincteric affection.	Late or no sphincteric affection.
Late or no affection of saddle shaped area.	Early affection of saddle shaped area.

Leveling in paraplegia	
Clinically	by investigations
History of girdle pain. The sensory level. The abdominal reflex (T6 - T12). Beevor's sign (T10). From scar or tenderness at the back (vertebral column).	Plain X-ray. Myelography. C.T. Scan. MRI.

Stage:

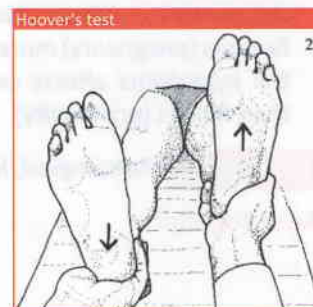
- **Acute:**
 - Flaccidity (shock stage) with retention of urine.
 - Spasticity (recovery stage)
- **Gradual:** Spasticity from the start.

Organic or Hysterical:**By:**

1. if sure signs of Δ tract lesion are present. (Organic)
2. by hoover test (see later).

Hoover test:

- Hoover's sign is a motor sign.
- The patient is placed in a supine/recumbent position. The examiner places his hand under the patient's heel.
- The sign based on the principle of synergistic contraction of muscle groups. Involuntary extension of the "paralysed" leg occurs when flexing the contralateral leg against resistance.
- To perform the test, the examiner should hold one hand under the heel of the "normal" limb and ask the patient to flex the contralateral hip against resistance, asking the patient to keep the weak leg straight while raising it.
- If the patient is making an honest effort, the examiner should feel the "normal" limb's heel extending (pushing down) against his or her hand as the patient tries to flex (raise) the "weak" leg's hip. Feeling this would indicate an organic cause of the paresis.
- If the examiner does not feel the "normal" leg's heel pushing down as the patient flexes the hip of the "weak" limb, then this suggests functional weakness (sometimes called "conversion disorder"), i.e. that effort is not being transmitted to either leg.



HEMIPLEGIA

Definition:

Paralysis of one side of the body due to Δ tract lesion at any point from the cerebral cortex down to the 5th cervical segment (origin of brachial plexus).

Causes:**1. vascular causes:****a. thrombosis:** Virchow's triad:

- vessel wall disease** (Cerebral atherosclerosis, vasculitis)
- increased blood viscosity** (Polycythemia, Thrombocytosis)
- stagnant circulation** (Heart Failure, Systemic hypotension)

b. embolism: the sources

from heart:

- mitral stenosis with AF
- sub acute bacterial endocarditis on the aortic or mitral valve
- mural thrombosis after MI

from distal vessels

- Arterial: detached atheromatous plaque
- venous: DVT with ASD or VSD

c. haemorrhage:

Intracerebral: most common cause is lenticulo striate A

Subarachnoid

Subdural

2. infective causes: encephalitis and brain abscess

3. neoplastic causes: meningioma and glioma

4. demyelinating causes: MS

5. traumatic: cerebral laceration

6. congenital: cerebral palsy

7. hysterical

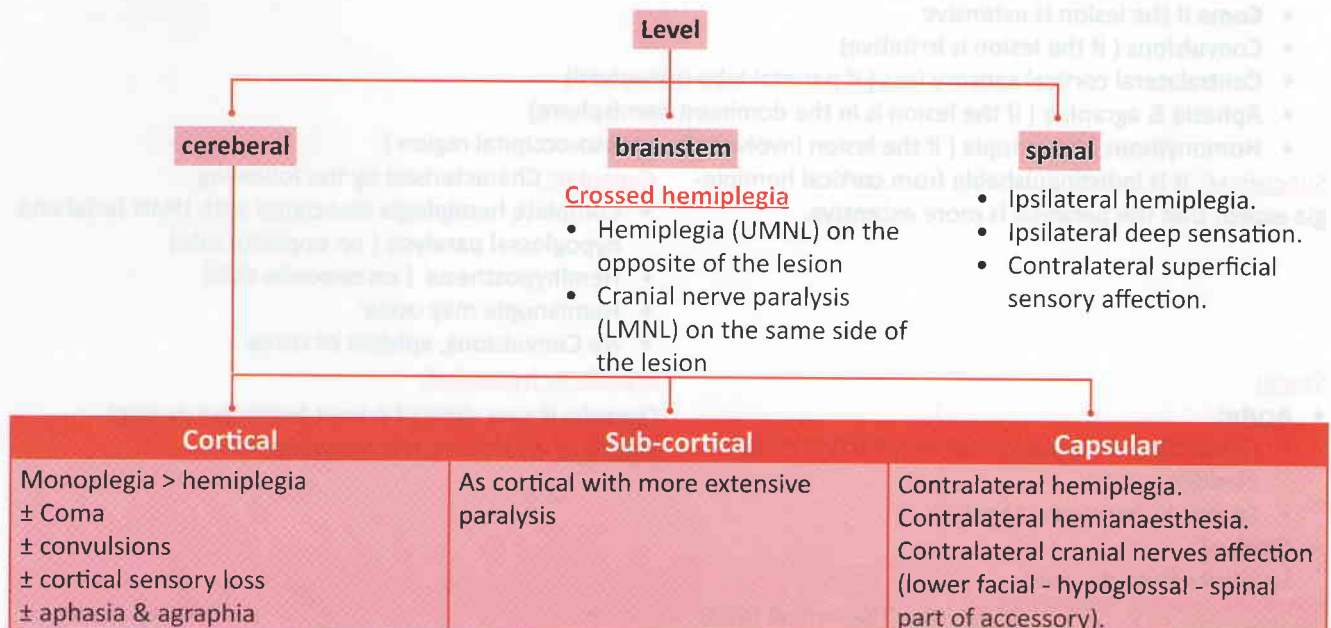
► N.B.**the causes of intracranial hge: HAT HAT**

- | | |
|--|-------------------|
| 1. hypertension:
intracerebral | 4. anticoagulants |
| 2. haemorrhagic blood
diseases | 5. trauma |
| 3. aneurysm rupture:
subarachnoid hge | 6. tumor |

Clinical Picture:

Diagnostic approach: Aetiological, level, stage and organic or hysterical.

UMNL at one side involving UL & LL with Circumduction Gait

level:

Site of the lesion

1. Spinal Cord.

the lesion is on one side of the cord & is situated between C1 & C5 segments, it is caused by : resulting in (Brown Sequard Syndrome) Characterised by:

- stab Wound
- DS
- Disk prolapse
- tumor

1. at the level of the lesion:

- Ipsilateral Localized LMNL of the Muscles supplied by affected segments.
- Ipsilateral loss of all sensations in the area supplied by the dorsal roots of the affected segments.

2. Below the level of the lesion:

- Ipsilateral Hemiplegia.
- Ipsilateral deep sensory loss and fine touch.
- Contralateral superficial sensory loss for pain , Temperature and simple touch, so touch diminishes on both sides :)

2. Brain Stem.

the lesion is on one side of the brain stem resulting in the picture of crossed hemiplegia Characterised by:

1. Hemiplegia on the opposite side of the lesion.
2. Cranial nerve paralysis of LMN nature on the same side of the lesion.

the nerves affected depend on the site of the lesion:

• Mid-Brain Lesion

Weber's Syndrome

- Hemiplegia (opposite side)
- 3rd Cranial nerve paralysis (same side)

Benedict's Syndrome

- Hemiplegia (opposite side)
 - 3rd Cranial nerve paralysis (same side)
 - Hemiataxia (opposite side)
- (intention Tremors) due to affection of the Red Nucleus.

• Medullary Lesion

Avellis Syndrome

- Hemiplegia (opposite side)
- 9th & 10 th Cranial nerve paralysis (same side)

Jackson's Syndrome

- Hemiplegia (opposite side)
- 11th & 12th Cranial nerve paralysis (same side)

• Pontine Lesion

Millard Gubler Syndrome

- Hemiplegia (opposite side)
- 6 th & 7 th Cranial nerve paralysis (same side)

Foville Syndrome

- Hemiplegia (opposite side)
- loss of Conjugate deviation of the eyes (same side) due to lesion in the medial Long. bundle (MLB).

3. Cerebral

the lesion in the cerebral hemisphere results in hemiplegia associated with UMN facial and hypoglossal paralysis on the opposite side of the lesion, but without any cranial nerve paralysis on the same side of the lesion.

Cortical : Characterised by one or more of the following:

- Coma if the lesion is extensive
- Convulsions (if the lesion is irritative)
- Contralateral cortical sensory loss (if parietal lobe is involved)
- Aphasia & agraphia (if the lesion is in the dominant hemisphere)
- Homonymous hemianopia (if the lesion involves the parieto-occipital region)

Subcortical : it is indistinguishable from cortical hemiplegia except that the paralysis is more extensive.

Capsular: Characterised by the following:

- Complete hemiplegia associated with UMN facial and hypoglossal paralysis (on opposite side)
- Hemihyposthesia (on opposite side)
- Hemianopia may occur
- No Convulsions, aphasia or coma.

Stage:

• **Acute:**

- Flaccidity (shock stage) with no affection of Uri Bladder.
- Spasticity (recovery stage)

• **Gradual:**

Spasticity from the start.

investigations & treatment

See Theoretical Book

DIABETIC PERIPHERAL NEUROPATHY

Sheet of Diabetic patient:

History:

- History of D.M. since.....
- Manifested by
- Investigated by
- Controlled by
- Complicated by

Examination:

1. General:

- **Head:** eye (any disease), teeth (lose of teeth).
- **Foot:** diabetic foot.
- **Blood pressure:**
 - Hypertension.
 - Postural hypotension (so, B.P. should be measured twice, during standing and in flat position).
- **Pulse:** conditions of the blood vessels.

2. Skin examination in a diabetic patient:

- Increase incidence of **infection**.
- **Trophic changes** "neuropathic manifestations".
- Vascular manifestations "**ischemia**".
- Effect of treatment: insulin injection "**lipo dystrophy**".
- Specific:
 - **Necroboiesis lipodica diabeticorum** (NPLD).
 - **Bullus diabeticorum**.

► N.B.

Neurological complication of DM

- Comas.
- Argyll Robertson's pupil.
- Diabetic lateral sclerosis.
- P.C. lesion.
- P.N.

► N.B.

Charcot's joint:

Lost deep sensation leads to destruction of articular cartilage which lead to increasing range of movement.

3. Heart examination in a diabetic patient:

- Ischemic heart disease.
- Cardiomyopathy.

4. Abdominal examination in a diabetic patient:

- **Liver:** fatty.
- **Kidney:** Kemilestle Wilson's syndrome "diabetic nephropathy".

5. Chest examination in a diabetic patient:

Increase infections particularly T.B.

Clinical picture of peripheral neuropathy:

Motor, sensory and autonomic:

summarized in the next table

Motor	Sensory		Autonomic
L.M.N.L.:	Superficial	Deep	C.V.S.:
• Wasting. • Trophic changes. • Hypotonia. • Hyporeflexia.	Distribution: Gloves & stocks		• Early parasympathetic loss: fixed sinus tachycardia. ECG: absent respiratory sinus rhythm. • late sympathetic loss: postural hypotension, difference should be more than 20 mmHg in systole & more than 10 mmHg in diastole. If no postural hypotension: B.P. while lying equal to it while standing.
Distribution: (bilateral / symmetrical) • L.Ls. > U.Ls. • Distal > proximal. • Extensor > flexor. • ± adductor > abductor	• Irritation • Pain. • Parasthesia. • Destruction • Hypoesthesia. • Anaesthesia. (Gloves & stocks)	• Vibration. • Position. • Movement. • Muscle. • Nerve.	Genital: impotence. GIT: Gastroparesis diabeticorum: " delayed emptying : dyspepsia, vomiting & distention" Diabetic enteropathy " change in bowel habit". Sweat: • Anhydrosis. • Gustatory sweating.
Effect: • Lost ankle , preserved knee. • High stepping gait • Wrist, feet drop			

Gait:

- High steppage (P.N.).
- Stamping gait (sensory ataxia).

Cranial nerves

3rd, 5th, 7th & 8th may be affected.

IMPORTANT NOTES

Causes of Thickened Nerves:

- Acromegaly
- Interstitial Hypertrophic P.N.
- Myxedema
- Amyloidosis.
- Neurofibroma
- Refsum's Neuropathy
- Leprotic Neuropathy

Causes of Sensory P.N.:

1. Diabetic neuropathy
2. Alcoholic neuropathy
3. Vitamin deficiency neuropathy
4. Arsenic neuropathy
5. Leprotic neuropathy

Causes of Lost Ankle with Preserved Knee

1. Epiconus lesion
2. Cauda equina lesion affecting S1 root.
3. Peripheral neuropathy
4. Subacute combined degeneration
5. Friedreich's ataxia.

Causes of Motor P.N.:

1. Lead neuropathy
2. Diphtheritic neuropathy
3. Acute infective polyneuritis.
4. Porphyrin.

Causes of Absent Ankle, Exaggerated Knee reflex

1. Subacute Combined Degeneration.
2. Pellagra (Lateral sclerosis + PN.)
3. Friedreich's ataxia.

CAUDA EQUINA

Defenition:

The collection of lumbo-sacral roots in the lower part of the spinal canal is known anatomically as the Cauda Equina. The lowermost three segments of the spinal cord (S3,4,5) are known anatomically as the Conus Medullaris. The above four segments (L4,5 S1,2) are known anatomically as the Epiconus.

Causes of Cauda Equina Lesion

1. Congenital: Spina bifida.
2. Traumatic:
 - fracture dislocation of the lumbar vertebrae.
 - Post traumatic disc prolapse
3. Inflammatory: Pott's disease of the lumbar vertebrae.
4. Neoplastic:
 - Vertebral:
 - Primary: osteoma, haemangioma
 - Secondary: metastatic.
 - Meningeal: meningioma
 - Radicular: neurofibroma.
5. Degenerative: Lumbar Spondylosis.

Clinical Picture:**I. Motor Manifestation:**

- There is motor weakness or paralysis in one or both lower limbs.
- The weakness or paralysis is of a L.M.N. nature i.e. it is associated with wasting, hypotonia and hyporeflexia.
- The motor weakness or paralysis will affect the muscles which are supplied by the affected root (See before)

II. Sensory Manifestations:

- Cauda equina lesions usually have a painful onset. The pain is radicular and is referred to the lower limbs
- either along the femoral distribution when the lesion affects the upper lumbar roots or along the sciatic distribution when the lesion affects the lower lumbar. and sacral roots. Later on there is hyposthesia or anaesthesia in the dermatome supplied by the affected root.
- The sensory impairment affects both superficial and deep sensations.

III. Autonomic Manifestations:

1. **Sphincteric manifestations** are usually late unless the lesion is bilateral and affects mainly S2,3,4 roots (roots of innervation of the bladder). The sphincteric disturbances are in the form of:
 - Sensory atonic bladder.
 - Motor atonic bladder or
 - Autonomic bladder.
2. **Vasomotor changes and trophic ulcers** may occur in the L.L

► N.B.

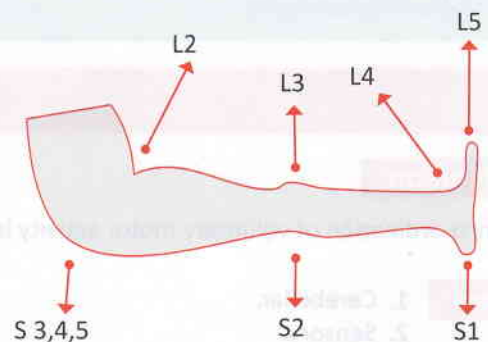
The cauda equina consists of nerve roots while the conus and epiconus form part of the spinal cord.

I. Motor Manifestation:

Root	Action	Muscle
L2	Flexor of the hip	Ileopsoas.
L3	Extensor of the knee	Quadriceps
L4	Dorsiflexion of the ankle	Anterior tibial group
L5	Dorsiflexion of the toes	Anterior tibial group & glutei
S1	Plantar flexion of the ankle and toes	Calf muscles & glutei
S2	Flexor of the knee	Hamstrings
S3,4,5	Anal contraction	Anal and perianal muscles

► N.B.**Clinical Picture Of Conus Medullaris Lesion: (S34,5 Segment)**

1. Early urinary incontinence (autonomic bladder) and faecal incontinence.
2. Impotence.
3. Impairment of sensation in the saddle-shaped area, (usually of a dissociated nature)
4. No motor or sensory disability in the lower limbs.

**II. Sensory Manifestations:**

L1	Upper 1/3 front of thigh.
L2	Middle 1/3 front of thigh.
L3	Lower 1/3 front thigh.
L4	Anterolateral aspect of thigh, front of knee, anteromedial aspect of leg, medial aspect of foot & big toe.
L5	Lateral aspect of thigh, lateral aspect of leg, middle 1/3 of dorsum of foot & middle 3 toes.
S1	Posterolateral aspect of thigh & leg, lateral 1/3 of dorsum of foot & little toe.
S2	Posterior aspect of thigh, leg & sole of the foot.
S3,4,5	Anal, perianal & gluteal region (saddle shaped area) in concentric manner.

► N.B.**Clinical Picture Of Epiconus Lesion: (L4,5 S1,2 Segments):**

1. Weakness or paralysis in the lower limbs, in the muscles supplied by L4s and S1,2
2. (dorsiflexors and plantar-flexors of the ankle and toes, the flexors of the knee and the
3. extensors of the hip).
4. The ankle reflex is absent while the knee reflex is intact.
5. Sensory loss from L4 to S2 segment (usually of a dissociated nature).
6. Bladder disturbances may occur in the form of precipitancy

SUBACUTE COMBINED DEGENERATION (S.C.D.)

Components :

1. pyramidal tract lesion.
2. Posterior column lesion.
3. P.N.

Causes:

1. vitamin B12 (mainly).
2. D.M.

► N.B.

Subacute means the onset within days.

Combined means affection of different parts as Δ tract, P.C. and P.N.

S.C.D. + cerebellar lesion = Friedreich's ataxia.

S.C.D. - P.C. = pellagra

ATAXIA

Defenition:

Inco-ordination of voluntary motor activity in absence of motor weakness $\pm$ disequilibrium.

Types:

1. Cerebellar.
2. Sensory.
3. Mixed ataxia = cerebellar + sensory
4. Vestibular.
5. Hysterical.

► N.B.

cerebellum is divided into:

1. archi cerebellum (equilibrium)
2. paleo cerebellum (not in human)
3. neo cerebellum (coorfination and increase tone)

So, in archi-cerebellar lesion (**Friedreich's ataxia**) the main complaint is the drunken gait

And in neo-cerebellar lesion (**Marie's ataxia**) the main compliant is inco-ordination.

In any cerebellar lesion there is **hypotonia & hyper-reflexia**.

Causes of cerebellar ataxia:

- **Heredofamilial:**
bilateral & symmetrical gradual onset & progressive course as **Friedreich's & Marie's ataxia**.
- **Symptomatic:** 2ry to
 - **Infection** (encephalitis).
 - **Vascular**.
 - **Alcohol or barbiturates intake**.
 - **Tumors**.
 - **D.S.** (the commonest cause).
- **Idiopathic:** in old age.

	Friedreich's ataxia	Marie's ataxia
Components	Archi-cerebellar lesion. Δ tract lesion. P.N. lesion. P.C. lesion.	Neo-cerebellar lesion. Δ tract lesion.
Tone & reflexes	decreased	increased
Speech	Staccato or scanning	Slurred, staccato or scanning.
Gait	Drunken gait	Scissoring or drunken gait
Ataxia	Mixed	Pure cerebellar
Planter reflex	Positive Babiniski	Positive Babiniski
Association	Pes-cavus. Heart lesion. D.M. (40%).	No

Clinical picture:**Archi-cerebellar lesion:**

- Staggering gait (wide based)
- Swaying on standing.

Neo-cerebellar lesion:

- Nystagmus (Chr.).
- Head nodding (D.D.).
- Trunk: titubation.
- Upper limb:
 - Intension tremors.
 - Dysmetry.
 - Decomposition of movement.
- Lower limb:
 - Unilateral: deviation of the body toward the affected side.
 - Bilateral: zigzag gait.

Specific co-ordination test**Fingers:**

- Finger to nose test.
- Finger to finger test.
- Finger to doctor's finger test.

Hand:

- Adiadokokinesia.
- Rebound "Holm's test".
- Buttoning and unbuttoning test.

Leg:

- Heal to knee test.
- Heal to doctor's finger test.
- Foot to foot "straight ling" : tendon gait (the earliest sign).

Investigations & treatment See Theoretical Book**► N.B.****D.D. of the head nodding**

- A.R. (with pulse (yes .. yes)
- Parkinsonism (static). (No .. No)
- Ataxia (kinetic).

► N.B.**Neurological diseases with intact sensation: (Puerly Motor Neurological Diseases)**

- Muscles disease (myopathy, myotonia, M.G., myositis)
- M.N.D.
- Marie's ataxia.
- Parkinsonism.
- Poliomyelitis.
- Chorea.
- H.S.P.

Finger to finger



Finger to doctor's finger



rebound test (at elbow level)



rebound test (at shoulder level)



Heal to knee test

**► N.B.**

In rebound test doctors should remove his watch and patient could remove his glasses to avoid patient injury.



SENSORY ATAXIA

Defenition:

It is ataxia due to loss of the proprioceptive sensations at any point in their pathway.

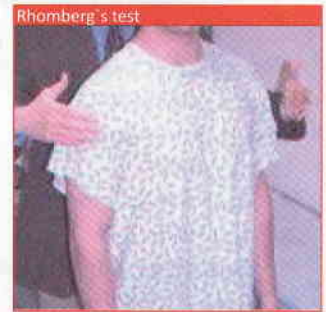
Causes:

1. Peipheral nerve: PN specially Diabetic, alcoholic.
2. Post root: Tabes Dorsalis.
3. Post Column : SCD.
4. Medial Lemniscus : brain stem lesions.
5. Thalamus : Thalamic Syndrome.
6. Cortical sensory area: Parietal lobe lesions.

Clinical Picture:

1. **Kinetic tremors** (tested by Finger to nose , Figer to Finger only on Closure of the eyes)
2. **Rhomberg`s test**: when the patient stands with his feet close together & his eyes closed, his body sways & he may fall if not supported.
3. **Stamping Gait**: heavy strike of the ground on walking due to lost deep sensation.
4. **Deep sensory loss**.
5. **Hypotonia & hyporeflexia**.

investigations & treatdment See Theoretical Book



MYOPATHY

Defenition:

Group of muscle diseases affecting skletal muscles characterized by gradual progressive degeneration of the muscles, when the the degenerative process is genitcally determind it's termed progrwssive muscular dystrophy.

Clinical Picture:

History:

Complaint: inability to stand from sitting position.

Family history: positive in his male brothers as it is X-linked disease (females only carrier).

Past history: ± corticosteroids.

Symptoms:

1. Clumsy gait.
2. Inability to climb the stairs.
3. Protuberant abdomen
4. Weakness and wasting of certain muscles (shoulder and pelvic girdles and trunk)

Examination:

LMNL: weakness, hypotonia (frog sign), hyporeflexia and wasting (except in Duchenne = psuedo hypertrophy) taking the following distribution:

- **bilateral and symetrical**
- **proximal** more than distal (pelvic and shoulder girdle)
- with **sparing of the following muscles:**

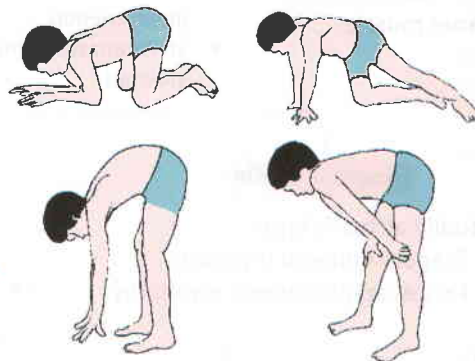
- 1- **S** Sternomastoid.
- 2- **T** Trapizus "upper fibers".
- 3- **P** Pectoralis major "clavicular head".

Effects of muscle weakness in myopathy:

1. Abdominal muscles: **pot belly abdomen**.
2. Compensatory **lordosis** due to weak extensors (disappear with sitting as it is a compensatory).
3. **Talipes equinus** with hyperkeratosis due to weak extensors.
4. Gait: **wide base + waddling gait** due weak glutei.
5. **Gower sign**.

► N.B.**No sensory affection in myopathy**

special type of myopathy: **facioscapulohumeral type** i.e. weakness of facial muscles

**Examination of muscles of the shoulder girdle:****1. Abductors:**

0 - 15°: **supra spinatus**.

15° - 90°: **deltoid**.

> 90°: **trapezius**.

2. Sternal head of pectoralis major: Ask the patient to put his hands on his waist and palpate anterior fold of axilla

3. Lattismus dorsi: Palpate the posterior fold of axilla & ask the patient to put his hands on his waist and cough

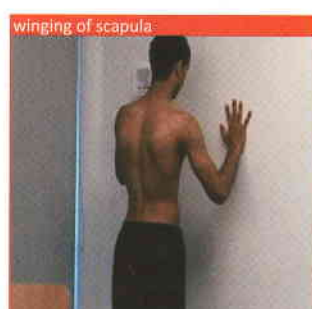
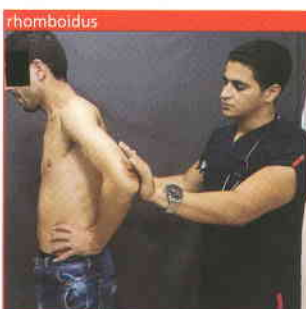
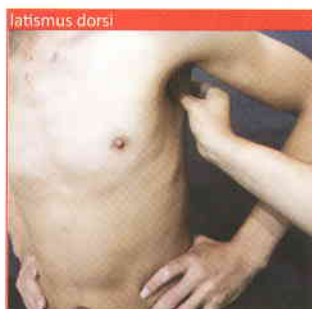
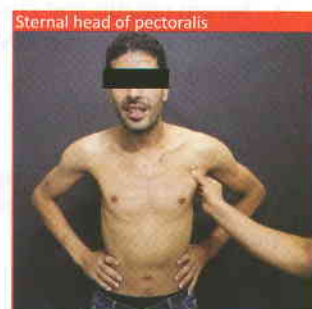
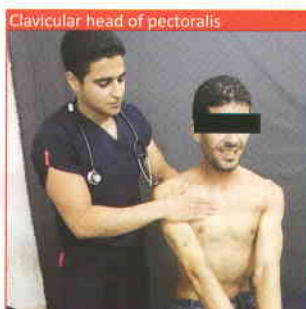
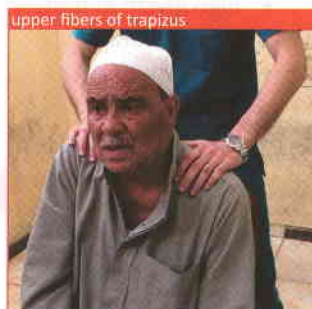
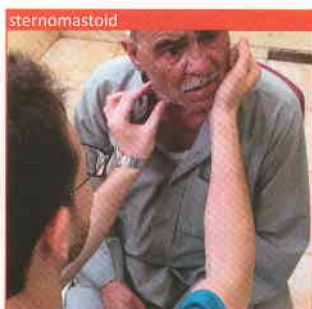
4. rhomboidus: Ask the patient to push backward against resistance

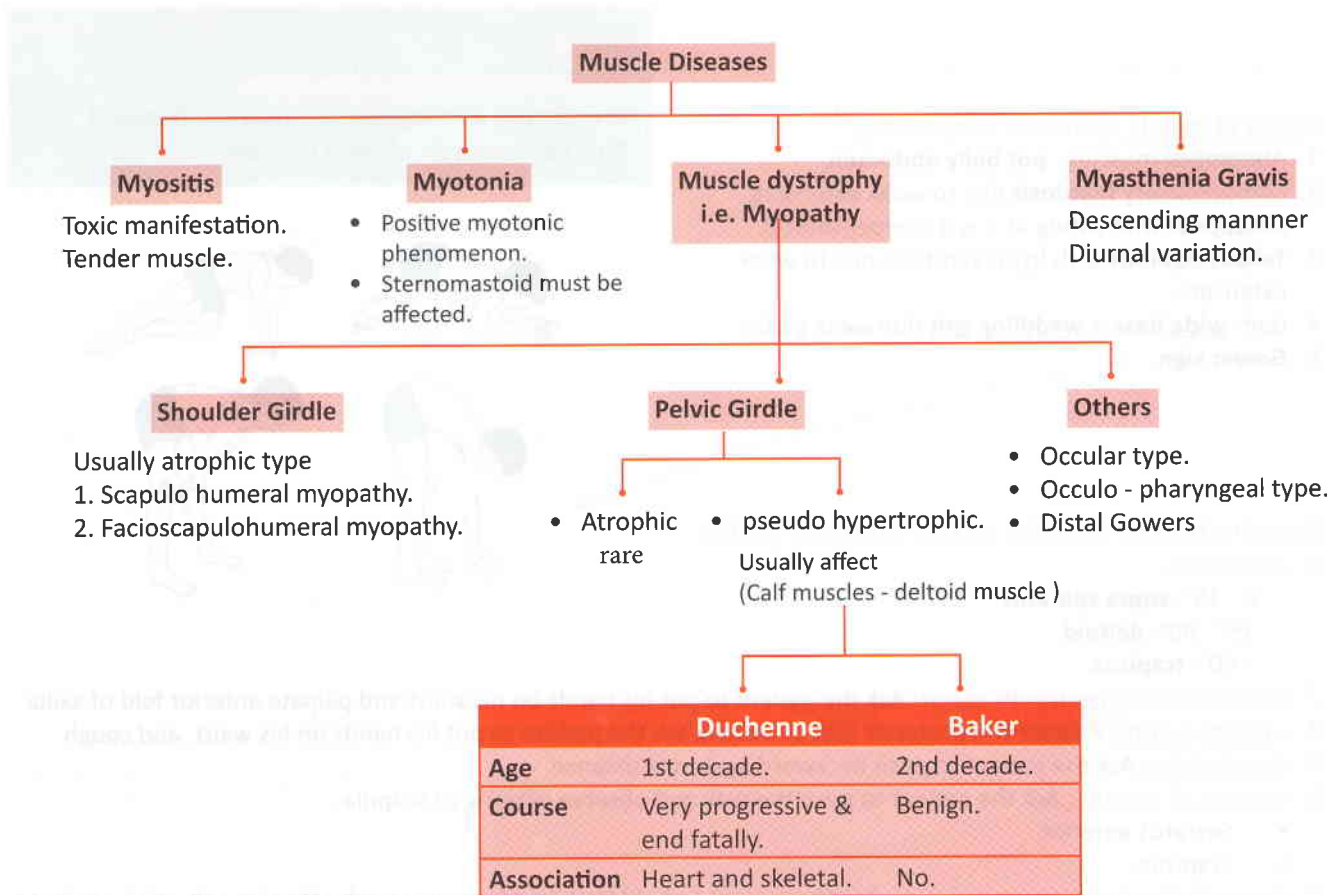
5. winging of scapula: Ask the patient to push the wall and observe winging of scapula:

- $\wedge$ Serratus anterior.
- $\vee$ Trapezus.

6. clavicular head of pectoralis major: Ask the patient to hold both hands against each other (see the pic) : palpate contraction of clavicular head of pectoralis major.

7. Sternomastoid and upper fibers of trapezius as cranial nerves





Investigations (very important):

- Serum creatin and creatinin.
- Serum CPK (isozyme M.M.).
- E.M.G.
- Muscles biopsy.

Treatment:

- high glycin in diet.
- Physiotherapy.
- Gene therapy.

Causes of Pseudo-Hypertrophy of Muscles

1. Duchenne Myopathy
2. Becker Myopathy.
3. Myotonia Congenita.
4. Acromegaly.
5. Myxoedema.

Causes of Pes Cavus

1. Friedreich's ataxia.
2. Duchenne Myopathy.
3. Peroneal Muscle atrophy.
4. Syringomyelia.

MULTIPLE SCLEROSIS (M.S.)

A demyelinating disease in which the insulating covers of nerve cells in the brain and spinal cord are damaged.

Types:

1. Remittent relapsing.
2. Primary progressive.
3. Secondary progressive.
4. Progressive relapsing.

Aetiology:

- unknown but may be:
- Auto-immune: antigen sheath Ab in C.S.F.
- Infection: viral, Chlamydia.

Precipitating factors:

- Trauma.
- Operations.
- Stress.
- Infection.
- Psychic trauma.

Clinical Picture: (MSC, MSC)

- 1- **M** Mentality Euphoria or depression.
- 2- **S** Speech Slurred, staccato or Scanning.
- 3- **C** Cranial nerves 2,3,7,8 plus MLB leads to ophthalmoplegia internuclearis.
Optic neuritis is a common Presentation.
- 4- **M** Motor Pyramidal tract lesion. Mono > para > hemi > quadriplegia.
with signs of UMNL (Hypertonia, Hyperreflexia, +ve Babinski).
✓ Acute onset but spastic from the start.
- 5- **S** Sensory P.C. (L.Hermitt's sign). → on flexion of the head there is sudden electric like sensation radiating to the back and limbs due to post. column involvement in the cervical region.
- 6- **C** Cerebellar ataxia.
- 7- **A** Autonomic Disturbance: Precipitancy & Impotence.

- **Criteria of M.S. with good prognosis:**
Female, young age, remittent relapsing type.

Investigations:

- MRI.
- C.S.F.
- Visual evoked response.

Treatment:

During attack:

- Methyl prednisolone 1 gm vial / day for 3 - 5 days.

In between attacks:

- B interferon.
- Vitamin B.
- Physiotherapy.

PARKINSONISM (SHAKING PALSY)

Defenition

It is a condition in which there are static regular rhythmic tremors associated with hypertonia of the muscles of the body and bradykinesia.

Causes

1. Idiopathic: Parkinson's disease (paralysis agitans).

- The cause is unknown
- There is degeneration of the pigmented cells (neuromelanin) of the substantia nigra, which becomes pale. The basal ganglia are also affected. This degeneration leads to deficiency of dopamine in the brain
- The age of onset is above 50 years.
- Both sexes are equally affected (**tremors > Rigidity , with gradual onset & progressive course**).

2. Symptomatic: There is a known cause which leads to deficiency of dopamine in the brain, but without structural changes in the substantia nigra or basal ganglia.

- **Inflammatory:** Encephalitis. (**Acute onset , regressive course , Tremors = Rigidity, acute onset and regressive course**)
- **Vascular:** Cerebral atherosclerosis (**with IHD > 40 yrs , Rigidity > Tremors**) with remission and exacerbation (due to opening of collaterals)
- **Toxic:** (Co & Mn poisoning , Rauwolfia drugs (Reserpine), Phenothiazines (Major tranquilisers)
- **Neoplastic:** Tumours of the basal ganglia.
- **Traumatic:** repeated trauma to the head as in boxers.

Clinical Picture:**1. Tremors**

- Regular, rhythmic and occur at the rate of 4-8/sec.
- They begin unilaterally in the U.L. and spread to all 4 limbs
- They give the hand the pill-rolling posture with the thumb moving rhythmically back and forward on the palm.
- They increase with emotional stress and fatigue and disappear during sleep and voluntary movements.

2. Rigidity & bradykinesia

- Affecting the proximal > distal
- Affecting more the flexors of the neck, trunk limbs resulting in the Flexion attitude.
- It may be present throughout the act to the same degree & is then described as **lead pipe rigidity**; it may be interrupted by the tremors & is then described as **cog wheel rigidity**
- Causing difficulty in starting the act of walking leading to a slow, shuffling (festinant) or short steppage) gait with propulsion

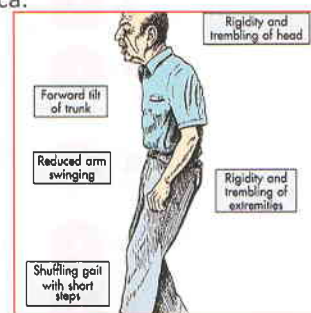
3. Loss of emotional and associative movements:

resulting in:

- Immobile face, with frequent blinking (mask face).
- Monotonous speech.
- Loss of swinging of the arms during walking.

4. Other clinical manifestations

- Oculo-gyric crisis: sudden spasm of the conjugate movement of the eyes, mainly upwards
- Greasy face and sialorrhoea.
- Diabetes insipidus.
- Obesity.
- Impotence or amenorrhoea.
- Glabellar reflex.

**Investigations & treatment**

See Theoretical Book

CHOREA**Definition**

Involuntary, static, irregular, dysrhythmic, sudden, jerky, pseudo purposive movement of any part of the body due to lesion in caudate nucleus.

Causes

1. **H.F.:** usually associated with Friedrich's ataxia athetotic movement.
2. **Symptomatic:**
 - Auto immune: rheumatic chorea with other Rh. Criteria but never with arthritis, it lasts within 3 - 6 months from its onset.
 - Infective: post encephalitis.
 - With pregnancy: chorea gravidarum.
3. **Idiopathic:** in old age.

Clinical Picture:

- Clinical picture of the associated disease as ataxia, asthenosis or rheumatic fever.
- choreic movement: tongue and facial muscles ↑ with emotions and ↓ with sleep.
- Hypotonia: specific tests for chorea.
 - When the patient stretches his arms, there is flexion at the wrist and over-extension of meta carpo phalangeal joint (MCP) and I.P. joints with fanning of the fingers "Scaphoid shaped hand".
 - When the patient elevates and supinates his arms, they deviate downwards and laterally and become pronated.
 - Pendular knee jerk (in dangling position).
- Emotional instability: a sudden laughing or crying is observed in most cases.
- Speech: choreic speech.

Treatment:

- Phenothiazines.
- Haloperidol.

NEUROLOGY (LONG CASE)

► 1. History

Personal History

Mr., 70 years old, driver, married and has four children, the youngest is 26 year old, from Hadayik Elqoba. He is a heavy smoker and right handed.

Complaint

Patient is complaining of: weakness in the left upper & lower limbs of 24 years duration.

Present History

The condition started 24 years ago by sudden onset and regressive course of weakness of the left upper and lower limbs, the muscles were flaccid for 4 weeks then became stiff with weakness more distal than proximal, abductors than adductors, flexors than extensors in lower limbs and extensors than flexors in upper limb, there is no wasting, fasciculation or trophic changes.

There is no involuntary movements or inco-ordination. From the onset of the disease, there is accumulation of food in left side, deviation of mouth to right side, deviation of tongue to left side, no dripping of saliva.

There is dropping of left shoulder and no other cranial nerves affection. There is speech troubles with the onset of the disease, but improved after 2 months.

There is hemihyposthesia in left side of the body and upper & lower parts of the face. The patient feels as he is walking on a cotton on left side. The patient denied that there is no sphincteric troubles.

There is no hypothalamic manifestations, no symptoms of increase ICT, no coma, no convulsion, no fever.

The patient used to suffer manifestations of systemic hypertension which is controlled by β - blockers. There is no other system affection.

Past History

Hypertension controlled by β - blockers, no other diseases

Family History

Family history is irrelevant.

Diagnosis

A case of organic spastic left side capsular hemiplegia due to thrombosis secondary to hypertension (atherosclerosis).

► 2. General Examination

- The patient with an average general condition, fully conscious, oriented by time, place and persons, with good mood and memory, co-operative with an average intelligency.
- The patient with an average built for his age, he lies comfortable in bed, no pallor, jaundice or cyanosis, no characteristic facies of medical important.
- **Respiratory rate:** 17 / min, pulse: 85 beats / min. regular, equal in both sides, temperature: 37.7o C. blood pressure: 140 / 90 mmHg (hypertension).
- **Head examination:** no ptosis, oedema or subconjunctival hemorrhage, there is deviation of mouth to right side & deviation of tongue to left side.
- **Neck examination:** no congested neck veins, regular carotid pulsation and no lymph nodes enlargement.
- **Upper limbs:** there is no tremors, deformities or clubbig.
- **Lower limb:** there is no oedema or clubbing.
- **Cardiovascular examination:** elevated BP, signs of left ventricular enlargement with heavig apex, accentuated 1st and 2nd heart sounds with ejection click. (systemic hypertension).
- No abnormality detected in other systems.

► 2. Neurological Examination

1. Speech:

no speech troubles.

2. cranial nerves:

I : no abnormality detected.
II : visual acuity & visual field: no abnormality detected. intact light and accommodation reflex.

III, IV & VI :

- inspection: no ptosis, no squint, pupil: regular, round, reactive to light & accommodation, equal in both sides. No nystagmus.
- power: the patient can move each eye separately and both eyes together in all directions. No abnormality detected.

V :

- inspection : no hollowness above or below zygoma.
- power : muscles of mastication & pterygoids acting normally.
- reflexes : absent jaw reflex & intact corneal reflex.
- sensation: loss of sensation in left half of the face (upper & lower parts + area supply by C2).

VII :

- inspection: left side : intact wrinkles of forehead, absent nasolabial fold, deviation of mouth to right side & no dripping of saliva.
- power: upper part normal, patient can elevate his eye brow & close his eyes.
- Lower part paralysed (weak orbicularis oris on smiling) indicated that contralateral lower facial nerve affection.

VIII : no abnormality detected.

IX & X : normal uvula elevation intact gag & pharyngeal reflex.

X1 (Spinal part of accessory):

- inspection: dropping of left shoulder.
- power: the patient can't elevate his left shoulder against resistance.

X11 :

tongue: no wasting & fasciculation.

The tongue deviated to left side.

There is contralateral cranial nerves affection (lower facial - hypoglossal - spinal part of accessory).

3. motor system

- **Inspection :** there is semi-flexed left upper limb and hyper extended left lower limb, no muscles wasting, no deformity, no trophic changes.
- **Palpation:** there is hypertonia of left side of the body clasp knife type affects antigravity more than progravity muscles.
- **Percussion:** there is no fasciculation or myotonia.
- **Power:** there is paralysis (weakness) of left side of the body affects progravity more than antigravity and distal more than proximal muscles.

4. Reflexes

- Planter reflex: positive Babinski sign.
- Abdominal reflex: lost on left side.
- Exaggerated deep reflexes in left upper and lower limbs.
- Pathological reflexes appear on left side: (Hoffman - wartenburg - finger reflex - patellar reflex - adductor reflex).
- Loss of superficial reflexes in left side of the body.
- Ankle, patellar & wrist clonus are presented

5. Sensations

There is hemihypoesthesia on the left side of the body, loss of deep sensation on left side & normal cortical sensation on right side (not examined on left side).

6. Back

there is no scars, deformity or tenderness.

7. Gait

the patient has left circumduction gait. (Hemiplegia gait)



RHEUMATOLOGY

||

Rare presentations of common diseases are much more common than common presentations of rare diseases.

||

RHUMATOLOGY INTRODUCTION

► Important terms:

Arthralgia:

Pain arising in joints without signs of inflammation (i.e. No limitation of movement).

Arthritis:

Joint with redness, hottness, tenderness, swelling & limitation of movement .

Mono arthritis:

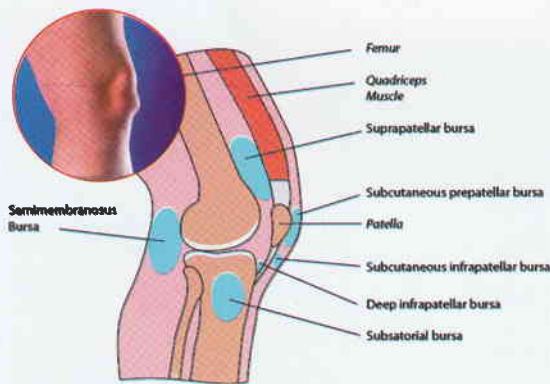
One joint inflammation as Acute Gouty Arthritis.

Oligo (pauci)arthritis:

2- 4 joints inflammation as Psoriatic Arthritis.

Poly arthritis:

affection of more than 4 joints As Rheumatoid Arthritis.



Bursitis:

inflammation of bursa (with Rhd. A.)

Enthesopathy:

inflammation at points of muscle & tendon insertion (in sero – ve Arthritis).

Myositis:

inflammatory disease of the muscle.

Synovitis:

Synovial joint inflammation.

Teno Synovitis:

Tendon sheath inflammation.

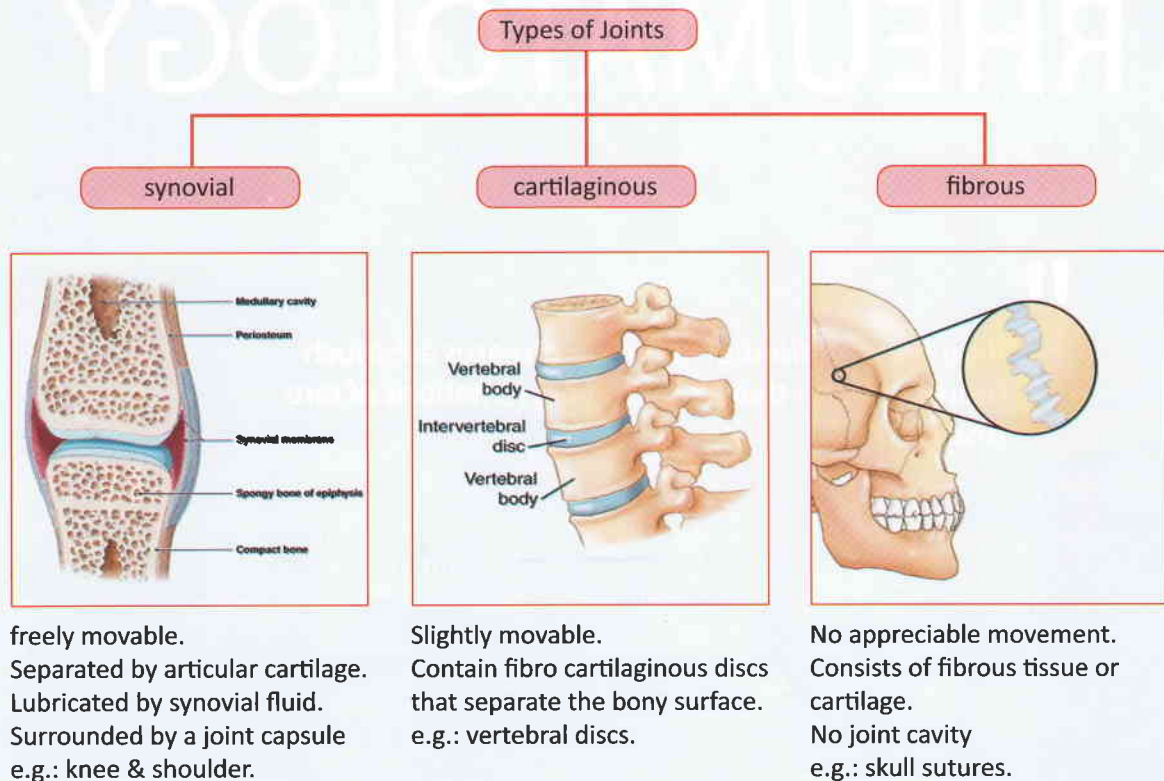
Centripetal arthritis:

polyarthritis starts at peripheral small joints (inrpharyngeal, metacarpopharyngeal or wrist) then spreads proximally to involve a larger joint (knee, hip or axial) e.g. Rh. A.

Centrifugal arthritis:

polyarthritis starts at a large joint (knee, hip or axial) then spreads proximally to involve peripheral small joints (inrpharyngeal, metacarpopharyngeal or wrist) e.g. Ankylosing spondylitis.

Types of Joints



RHEUMATOLOGICAL HISTORY

- Personal History.
- Complaint.
- History of Present Illness:
- Past History.
- Family History.

General.
Articular.
Extra articular.

► Personal History

NAS OMRH

Name

Age — **Child:** still's disease and Rheumatoid fever.
 — **Middle aged:** gout, RA and SLE.
 — **Old:** Osteoarthritis.

Sex — **Female:** SLE and RA.
 — **Male:** Ankylosing Spondylitis & Reiter's Disease.

Occupation.
Marital state.
Residence.
Habit.
Handedness.
Menstrual in female.

► Complaint

Painful hand joints, hotness, stiffness, limitation of movement ... etc

► General

Prodromal manifestation: (Fever- Headache - Malaise - anorexia - weight loss)

► Articular

- 1- Pain.
- 2- Swelling.
- 3- Stiffness.
- 4- Deformities.
- 5- Disability.

1- Pain

You have to differentiate between Articular & Non articular pain. and if articular (Inflammatory or Mechanical).

Articular	Non articular
Tender joint.	Tenderness outside joint lines.
Disturbed active & passive movement.	Passive movement is better than active.
Deformity.	No deformity.
RA	bursitis & tendonitis

Inflammatory	Mechanical
Increased by rest.	Increased by activity.
Decreased by activity.	Decreased by rest.
More in morning.	More at night.

2- Swelling

Causes:

- Joints (signs of inflammation).
- S.C. nodules.

هل مفاصلك فيها ألم؟
يزيد بالراحة ولا بالمجهود؟

?

► N.B.

Poorly localized hand & wrist pain + Numbness + night

pain = **carpal tunnel syndrome.**

Vertebral pain:

Upper: **rheumatoid arthritis.**

Lower: **ankylosing spondylitis.**

هل مفاصلك ورمت؟ أي مفصل؟
هل الورم مستمر ولا يروح وييجي؟

?

3- Stiffness

(morning stiffness) M.S.

Significant M.S. if >30 min.

But may improve by treatment so history of drugs intake is important.

مفاصلك مخشبه عليك الصبح؟
لمدة أديه؟

4- Deformities

See pictures of deformity in examination.

هل حصل تشوهات في اي مفصل؟

5- Disability

Functional Diagnosis.

هل أثرت علي شغلك ولا لا؟

► Extra articular**C.V.S.:**

- Palpitation (A.R).
- Pain (pericarditis).
- Thromboembolic manifestation.

Respiratory system:

- pain (pleurisy - effusion).
- Cough.
- Dyspnea (I.P.F.).

C.N.S.:

- Convulsion.
- P.N. - pain.
- Weakness.
- Muscle pain.
- Stroke.

Abdomen:

- Dysphagia.
- Abdominal pain.
- Kidney (L.L. edema - urine changes).

► N.B.

Extra articular manifestations are:

Mild in **Rheumatoid arthritis**.

Marked in **S.L.E.**

Don't occur in **Osteoarthritis**.

Skin:

- Alopecia.
- Rashes.
- Urogenital ulcers.
- Urticaria.
- Pigmentation.
- Cold peripheries. (Raynaud's).

L.N.:

- Swelling.

Eyes:

- Dry, red eyes.
- Pain.
- Photophobia.

► Past History

Trauma: suggests traumatic (or septic) arthritis and osteoarthritis.

skin manifestations of psoriasis: suggests psoriatic arthritis.

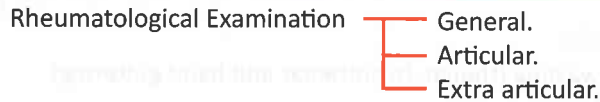
raynaud's phenomenon: suggests scleroderma.

► Family History

Familial mediterranean Fever runs in families.

Rheumatoid Arthritis has familial factor.

RHEUMATOLOGICAL EXAMINATION



► General

Temperature
pulse (peripheral pulsation for vasculitis.)

Blood pressure for vasculitis.
Face for cushinoid face (steroid therapy).

► Articular

8 points:

(SM SM CD TT)

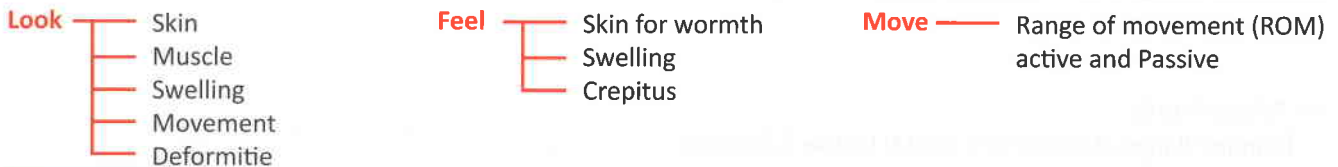
- 1- **Skin:** as erythema, ulcers and scar.
- 2- **Muscle:** as wasting of thenar, hypothenar and guttering.
- 3- **Swelling:** as effusion, synovium, bony and SC nodules.
- 4- **Movement:** Range of movement (active and passive).
- 5- **Crepitus:**
Definition of Crepitus:
a gritty sound or sensation produced by friction between bone and cartilage or the fractured parts of a bone.
- 6- **Deformities & describe it:** as:
Ulnar deviation (MCP)
Swan neck.
Button hole.
Z shaped thumb
- 7- **Tenderness:** in joints or surrounding structures.
- 8- **Special Test:** as Carpal Tunnel syndrome

Grades of Tenderness:

- 1- Patient says.
- 2- Patient winces.
- 3- Patient withdraws.
- 4- Patient refuse joint touch.

Another method for joint Examination:

Look - Feel - Move



► Extra articular

C.V.S.:

- Effusion, H.F. & A.R.

Respiratory:

- Effusion - Crepitation (I.P.F.).
- **Caplan's syndrome**
- (R.A. - lung nodules - pneumoconiosis)

C.N.S.:

- P.N.
- Myopathy (from steroid therapy).
- Pyramidal tract lesion (compression).

Abdomen:

H.S.M. (still's disease).
felty's syndrome = super RA.

Skin:

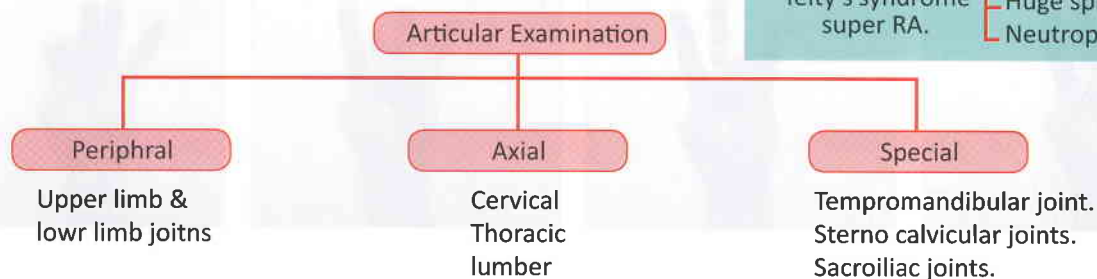
- Alopecia, Raynaudes.
- Nail fold infarction (psoriasis).

L.N.: Swelling.

Eyes: Dryness & redness.

► N.B.

felty's syndrome = severe Rheumatoid super RA.
Huge spleen
Neutropenia



► Hands & Wrist Examination

1- Skin:

look for erythema, ulcers, or scar.

2- Muscle:

look for wasting (thenar, hypothenar and hand guttering)

Palmar Erythema



Examining Thenar



Examining Hypothenar



Hand Guttering

**3- Swelling:**

look for effusion, synovium, bony, SC nodules.

Swelling of the dorsum

► **N.B.**

Heberden's and Bouchard's Nodules:
bony swelling (osteophytes)
present in PIP and DIP.
Occurs in osteoarthritis.

Heberden's and Bouchard's Nodules

**4 - Movement:**

Examine Range of movement (ROM) (active & passive)

Fingers Extension



Fingers flexion



Wrist flexion



Wrist Extension



Opponents muscles



Opponents muscles



Opponents muscles



Opponents muscles

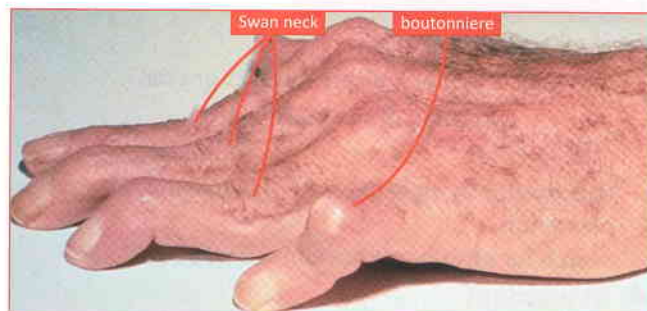


5- Crepitus: start from MCP and wrist

6- Deformities & describe it:

as the following:

- **Ulnar deviation** (at the level of MCP)
- **Radial deviation** (at the level of wrist)
- **Swan neck:**
Hyperextension at PIP joint, hyperflexion at DIP.
- **boutonniere:**
Hyperflexion at PIP joint with hyperextension at DIP
- **Z shaped thumb:**
Fixed flexion and subluxation at the MP joint and hyperextension at the IP joint.
- **Trigger finger:**
Flexion at both PIP and DIP due to nodule trapped behind the tendon.
- **Fusiform finger:** Swelling of the PIP
- **Mallet finger:**
injury to the tendon that straighten the PIP, Result in inability to straighten the last joint.



► **N.B.**

Deformity may be correctable if in soft tissue or correctable in bone and cartilage.

7- Tenderness:

Examine for tenderness in joints or surrounding structures.

► **Grades of Tenderness:**

- 1- Patient says.
- 2- Patient winces.
- 3- Patient withdraws.
- 4- Patient refuse joint touch.



8- Special Test: e.g. Carpal Tunnel syndrome:

Phalen's test:

The patient is asked to hold their wrist in complete and forced flexion (pushing the dorsal surfaces of both hands together) for 30–60 seconds



Tinel's Test:

Lightly tap over the nerve to elicit a sensation of tingling or in the distribution of the nerve.



► Elbows & R.U.J Examination

1- Skin: as erythema, ulcers, sinuses or scar.

2- Muscle: waisting of the muscles.

3- Swelling:

In posterior triangle between 2 epicondyles & olecranon.

search for effusion, synovium, bony, SC nodules.

4- Movement:

Elbow:

full flexion & extension.



R.U.J.:

shoulder adduction & elbow flexion do supination & pronation.



5- Crepitus:

crepitus is felt on Radius head with shoulder adduction & elbow flexion do supination & pronation.

6- Deformities & describe it:

Flexion deformity.

Integrity of collateral ligaments with fully extended elbow.

7- Tenderness: joints or surrounding structures.

8- Special Test: no special test.



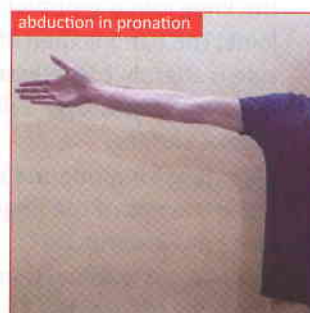
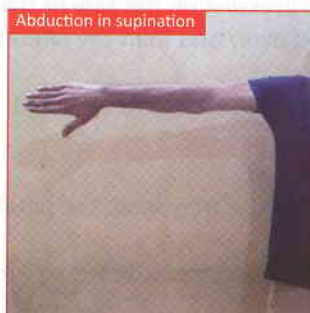
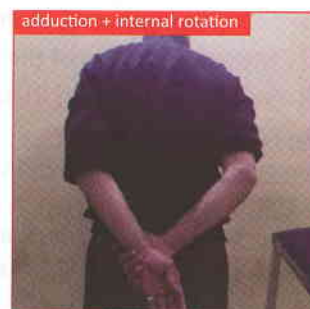
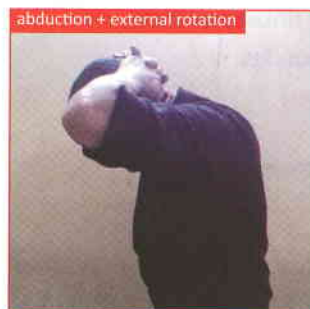
► Shoulder (acromio-clavicular joint) Examination

- 1- **Skin:** as erythema, ulcers, sinuses or scar.
- 2- **Muscle:** as wasting of the muscles
- 3- **Swelling:** as effusion, synovium, bony, SC nodules.
- 4- **Movement:**
Place behind neck (abduction + external rotation).
Place behind back (adduction + internal rotation).
Abduction in supination.
Abduction in pronation.
- 5- **Crepitus:**
- 6- **Deformities & describe it:**
- 7- **Tenderness:** joints or surrounding structures.
- 8- **Special Test:** no special test.

► N.B.

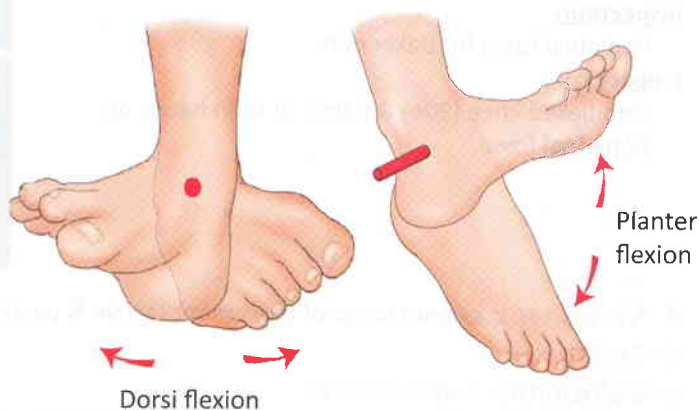
Rotator cuff injury e.g. **Supraspinatus tendonitis:**

Pain on start of abduction till 45° (active or passive)
Patient can continue abduction without pain by deltoid.



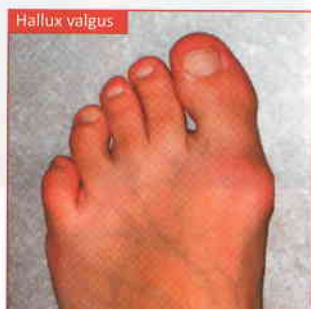
► Ankle & foot Examination

- 1- **Skin:** erythema, ulcers, sinuses or scar.
- 2- **Muscle:** wasting of the muscles.
- 3- **Swelling:** effusion, synovium, bony, SC nodules.
- 4- **Movement:**
Ankle:
 - Dorsi flexion (15°)
 - Planter flexion (45°).**Subtalar joint:**
 - Inversion (20°)
 - Eversion (10°).

5- **Crepitus:**6- **Deformities & describe it:**

Hallux valgus, Hammer toe, Talipes equinus & Pes cavus.

the rest of examination is the same as previous...

7- **Tenderness:** joints or surrounding structures.8- **Special Test:** no special test.

► Knee Examination

1- Skin: as erythema, ulcers, sinuses or scar.

2- Muscle: wasting of the muscles.

3- Swelling: (Knee Effusion)

A- Front Examination:

Inspection: Lost depression around patella.

Palpation:

Bulge test: for mild effusion.

The suprapatellar bursa is first emptied by squeezing 15 cm above the patella. The medial compartment of the knee joint is emptied by pressing on the side of the joint. The hand is then lifted away and then the lateral side is sharply compressed.

If the test is positive, a ripple is seen on the flattened, medial surface.

Patellar tap: for moderate effusion.

using the tips of the fingers of the free hand, the patella is hit squarely and with force downwards.

If the test is positive then the patella can be felt striking the femur with a click and bouncing off again.

Fluctuation test: for tense effusion.

place the webs of both hands 2cm above and 2cm below the patella then proceed to alternately apply downward pressure with each hand (one hand pushes, the other hand relaxes).



B- Back Examination:

Inspection:

Popliteal fossa for Baker cyst.

Palpation:

semiflexed knee (90°) & palms of both hands on popliteal fossa.



4- Movement: examine range of movement (active & passive)

5- Crepitus:

6- Deformities & describe it:

as: Genu valgus, Genu varus, genu recurvatum & Flexion deformity.



7- Tenderness: joints or surrounding structures.

8- Special Test: Examination of collateral ligaments stability.

Hold the knee in semi-flexed position.

Apply medial and lateral stress on the knee joint.

Excessive movement suggests collateral ligament instability.

lateral collateral lig. examination



medial collateral lig. examination

**► Hip Examination**

1- Skin: as erythema, ulcers, sinuses or scar.

2- Muscle: wasting of the muscles.

3- Swelling:

effusion, synovium, bony, SC nodules.

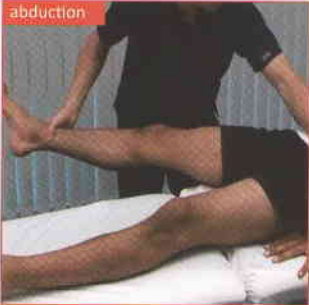
4- Movement:

Flexion, Extension.

adduction, abduction.

internal and external rotation.

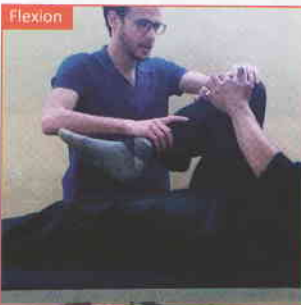
abduction



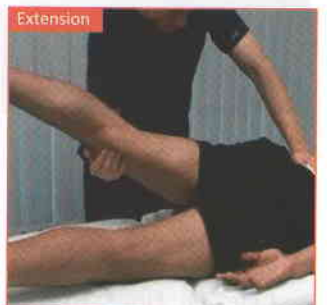
adduction,



Flexion



Extension



Internal rotation



external rotation



5- Crepitus:

6- Deformities & describe it:

7- Tenderness: joints or surrounding structures.

8- Special Test: no special test.

► Spine Examination

- 1- Skin:** as erythema or pigmenations.
- 2- Muscle:** wasting of para-vertebral muscles.
- 3- Swelling:**
 - soft (inflammation)
 - hard (SC nodule)
 - DD: meningocele (neural tube defect)

4- Movement

Mid. Cervical

- Flexion (chin to chest).
- Extension (occiput to wall).

Atlanto-occipital: head nodding.

Atlanto-axial: lateral rotation.



Thoracic

chest expansion by hand & tape meter.

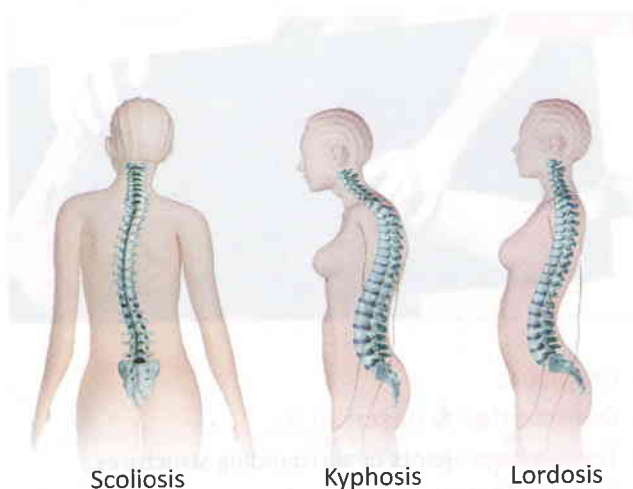
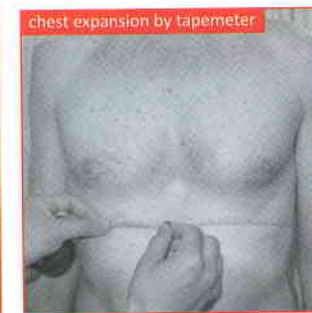
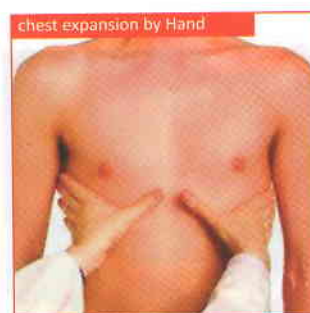
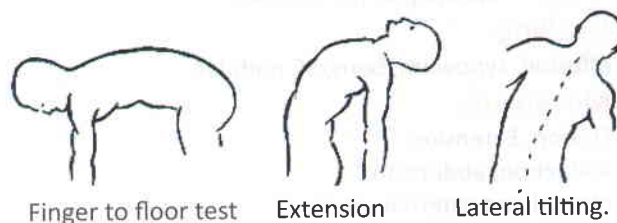
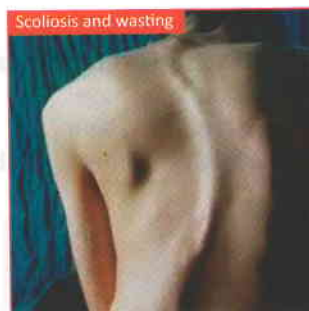
Lumbo- sacral.

1. Flexion: Finger to floor test (> 10 cm)
2. Extension: backward movement.
3. Lateral tilting.
4. Rotation
5. Schober's test see below

5- Crepitus.

6- Deformities: as:

- flexion of cervical vertebrae
- flexion of thracic veribrae (**Kyphosis**)
- exageration of lumbar lordosis (**lordosis**)
- loss of lumbar lordosis
- lateral curvature of the spine (**scoliosis**)
- pott's, fracture, malignant deposition.



7- Tenderness:

fist or medical hammer



► N.B.

Question Mark sign

in Ankylosing Spondylitis:
flexion of thoracic vertebrae
and loss of lumbar lordosis



► N.B.

Anatomical Land Marks:

Iliac crest = level of L4

PSIS = level of S2

Dimple of venus = Sacroiliac joint

8- Special Test:**Original Schöber Test**

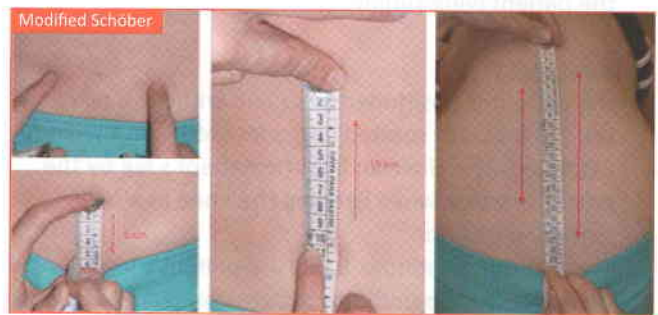
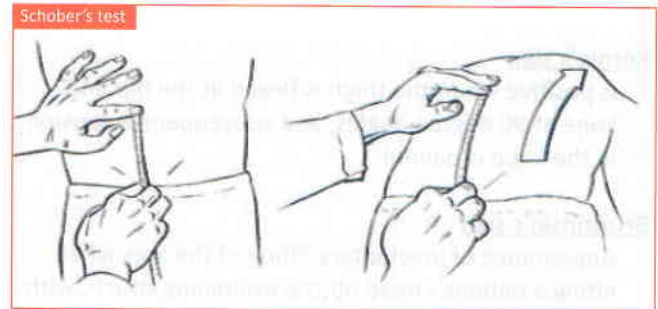
from standing position, mark a line on lumbosacral level. A second line is marked 10 cm above it. measure increased distance between the 2 points in erect and flexion positions.

Modified Schöber Index (also called short Schöber test)

from standing position, mark a line on lumbosacral level (between the dimple of venus) . A second line is marked 10 cm above it. A third line is marked 5 cm below the first line. measure increased distance between the 2nd and 3rd points in erect and flexion positions.

Modified-modified Schöber Test

from standing position, locates the inferior margin of the PSIS with the thumbs and then marks the intersections of the PSIS by drawing a horizontal line. A second line is marked 10 cm above it. A third line is marked 5 cm below the first line. measure increased distance between the 2nd and 3rd points in erect and flexion positions.

**The idea of all of them**

is to measure the increased distance between 2 points of the spinal cord which reflect the ability of the spines to be flexed.

► Sacro iliac joint:**Springing of the pelvis:**

Abduct pelvis by both hands from SIS leads to pain.

Pressure test:

Lateral and direct pressure

Faber test (patric test):

Flexion, Abduction, and External Rotation. (to put heel of the patient on the opposite knee & press on flexed leg down to the bed leads to contralateral pain)

this test examine the contralateral sacroiliac joint and the ispiilateral hip.



Gaenslen's test:

the hip joint is flexed maximally on one side and the opposite hip joint is extended, stressing both sacroiliac joints simultaneously. This is often done by having the patient lying on his or her back, lifting the knee to push towards the patient's chest while the other leg is allowed to fall over the side of an examination table.

**► N.B.****Sciatic Nerve Examination**

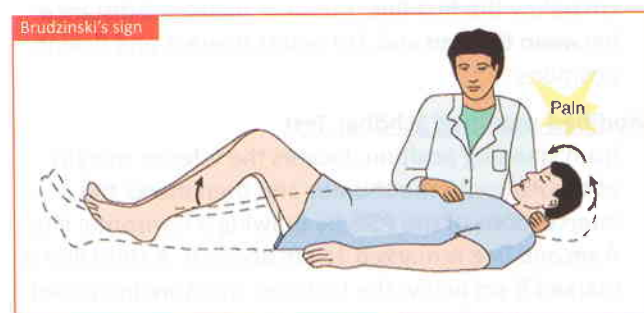
signs of meningeal irritation:

Kernig's sign

is positive when the thigh is flexed at the hip and knee at 90 degree angles, and subsequent extension in the knee is painful.

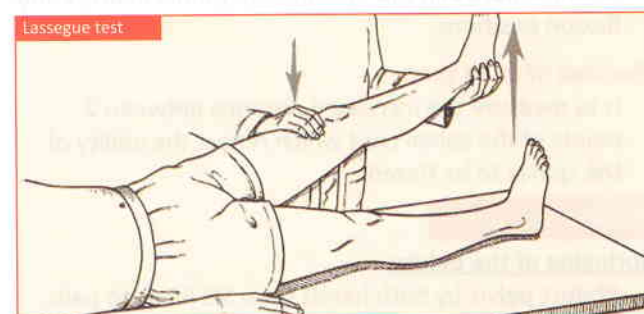
**Brudzinski's sign**

Appearance of involuntary lifting of the legs when lifting a patient's head off the examining couch, with the patient lying supine.

**Lassegue test**

the patient is positioned in supine without a pillow, the hip medially rotated and adducted, and the knee extended. The clinician lifts the patient's leg by the posterior ankle while keeping the knee in a fully extended position.

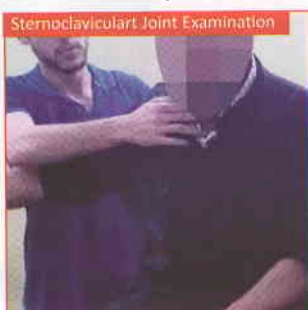
The clinician continues to lift the patient's leg by flexing at the hip until the patient complains of pain or tightness in the back or back of the leg.

**► Sternoclavicular Joint:**

Ask the patient to flex the arm at the level of shoulders

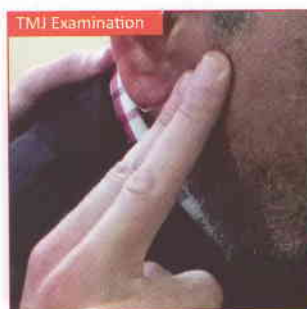
abduct and adduct the arm.

feel the crepitus on the sterno clavicular joint.

**► T.M.J.:**

Ask patient to Open, close, protrude, retract the mandible.

Palpate for tenderness & crepitus.



BABY STEPS FOR EXAMINATION OF THE HAND

An illustration of hand examination in rheumatology in one page . Here is what you really need to master in rheumatological examination with understanding what behind the technique and being able to identify the abnormal findings and using them to reach to the diagnosis ...

Inspect Skin



Inspect and palpate Muscles; thenar



hypothener



Guttering or not



Search for swelling on extensor surf.



Movement (Active then Passive)



Wrist flexion



Wrist Extension



Opponents muscles



Opponents muscles



Opponents muscles



Opponents muscles



Check tenderness



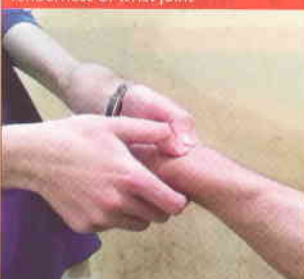
Check tenderness



Check tenderness



Tenderness of wrist joint



phalen's test



Phalen's test



tinel's test



RHEUMATOID ARTHRITIS

► Definition:

Chronic connective tissue disorder characterized by symmetrical poly-articular erosive manifestations associated with extra-articular manifestations.

► Pathology:

Arthritis:

first: synovitis **then:** granulation (pannus) and erosive destruction.

lastly: fibrosis and deformity.

Subcutaneous Nodule: connective tissue with chronic inflammatory cells with central necrosis.

Vasculitis: usually small vessel vasculitis.

► Clinical Picture:

Type of patient:

F:M = 3:1 - Age of onset 20-40

General symptoms:

Fever, Malaise, Loss of body weight and Anorexia.

Articular (3Ds)**Description:**

Morning stiffness, Swollen, red, warm with limitation of movement.

Distribution:

Symmetrical centripetal polyarthritis of the small peripheral joint; wrist, MCP and PIP are involved while DIP are usually spared,

Deformity: (erosion, destruction and fibrosis)

- Ulnar deviation.
- Boutonniere deformity.
- Swan neck deformity.
- Thumb deformity.
- hyperextension at the IP joint.
- Hammer toes.
- Flexion contractures.
- Triggered finger.

Extra-articular

C.V.S: Pericarditis - Myocarditis – Endocarditis - IHDs

Chest: Interstitial pulmonary fibrosis and Caplan's syndrome: (R.A. - lung nodules - pneumoconiosis)

Abdomen: Pancreatitis and Hepatosplenomegaly

C.N.S: Psychosis, Chorea, Depression Epilepsy

Skin: Subcutaneous nodule and Palmer erythema

eye: Conjunctivitis, Scleritis and scleromalacia

Blood: Anemia

Hand Guttering



Swelling of the dorsum



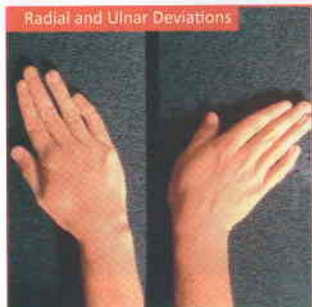
Fusiform finger



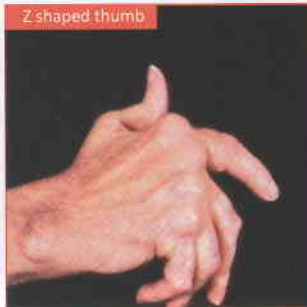
Mallet Finger



Radial and Ulnar Deviations

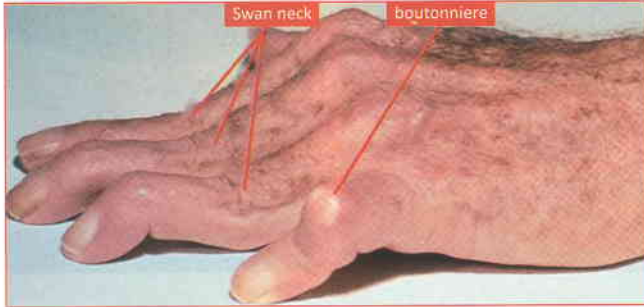


Z shaped thumb



Swan neck

boutonniere



Diagnostic Criteria (ACR/EULAR)**Symptoms Duration:** (as patient report)< 6 weeks: 0> 6 weeks: 1**Joint Distribution:**1 large joint: 02-10 large joints: 11-3 small joints: 24-10 small joints: 3>10 small joints: 5**Serology:**-ve RF and -ve ACCP: 0low +ve RF or ACCP (<3x lower normal value) : 2high +ve RF or ACCP (>3x upper normal value) : 3**Acute phase Reaction:**Normal ESR & CRP: 0Abnormal ESR & CRP: 1

Score > 6 = RA

Disease Activity Score (DAS) 285 PIP X 2
5 MCP2 wrist 2 Ankle
2 elbow 2 Knee

Swelling (SW 28)

Tenderness (Ten 28)

Patient global assessment of disease activity over last week (0-10)

Formula:

 $(0.56 \times \sqrt{\text{Ten } 28} + 0.28 \times \sqrt{\text{SW } 28} + \text{ESR } \times 7 + 0.014 \times \text{pt assessment})$

Normal Activity = 3.2 - 5.1

less than 3.2 = inactive

More than 5.1 = very active

Criteria of Joint Activity:

Swelling

Tenderness

Erythema

Warmness

► Investigations:**Blood:** CBC, ESR & CRP**Serological tests:** RF, LE, ANA and Recent anti CCP**X-ray****Aspiration of synovial fluid****► N.B.****Rheumatoid Factor:**

Mainly IgM directed against Fc of IgG

Positive in about 85% of RA patients, Nonspecific for RA but usually used for follow up & severity evaluation

Methods:

Latex (synthetic material - Rose-Welch (sheep RBCs)

Bentonite (clay)

False positive:

5% of healthy people

10-20% of people over age 65

Other sero-positive diseases

Bacterial and viral infections

Gammopathy, Granuloma & SBE

Anti CCP: cyclic citrullinated peptideThe most common tests for anti-citrullinated protein antibodies (**ACPAs**) are the **anti-CCP** (cyclic citrullinated peptide) test and the Anti-MCV (anti-mutated citrullinated Vimentin).Recently a serological point of care test (**POCT**) for the early detection of RA has been developed. This assay combines the detection of rheumatoid factor and anti-MCV for

diagnosis of RA and shows a sensitivity of 72% and specificity of 99.7%

Diagnostic Criteria (American Rheumatism Association)

(4 or more of the following):

1. Morning stiffness (> 1 hour) for > 6 weeks

2. Soft tissue swelling of 3 for > 6 weeks

3. Arthritis in at least 1 of:

MCP, PIP or wrist for > 6 weeks

4. Symmetric arthritis for > 6 weeks

5. Rheumatoid nodules

6. Serum RF

7. X-ray changes: erosions or periarticular osteopenia

Treatment:**NSAIDs:** for relief of pain & inflammation**Cortisone:****Disease modifying anti-rheumatic drugs (DMARDs):**

sulphasalazine, Gold, Penicillamine and Chloroquine

Immuno suppressive:

- Methotrexate
- Leflunomide (anti pyrimidine)
- Infliximab, Adalimumab (TNF α blockers)
- Anakinra (Interleukin - 1 blocker)

Intra articular injection of cortisone

SYSTEMIC LUPUS ERYTHEMATOSUS

► Definition:

An autoimmune disease characterized by clinical manifestations affecting multiple organs, including the skin, joints, kidneys and nervous system.

► Clinical Picture:

Type of patient:

F:M = 9:1 - reproductive years, 14 - 40

General symptoms:

Fever, Malaise, Loss of body weight and Anorexia.

Articular**Arthritis and arthralgia:**

Non-erosive, symmetric involving 2 or more small or large peripheral joints.

Extra-articular (main manifestations)**Renal (Lupus nephritis):**

immune complex-mediated glomerulonephritis.

Proteinuria, haematuria, pyuria, or red cell casts

Oedema and hypertension.

End stage renal failure in less than 5% of patients.

Stages of renal affection in SLE:

I: Normal Glomeruli	Mild proteinuria
II: Mesangioproliferative GN	Asymptomatic hematuria or proteinuria complete cure with corticosteroid
III: Focal proliferative GN	Responds to treatment with high doses of steroids
IV: Diffuse proliferative GN	Treated with corticosteroids and immunosuppressants
V: Membranous GN	Characterized by extreme edema and protein loss
VI: Sclerosing GN	Significant renal insufficiency (RF) Not responding to medical therapy

► Investigations:

Blood: CBC, ESR, CRP & KFT

Serological tests: RF, LE, ANA, Anti-ds DNA, Anti-Sm, Anti-RNP, Anti-Ro (SSA), Anti-La (SSB) and Anticardiolipin

Complement levels: decreased

Immunoglobulin: increased

LE cell

C.V.S: Pericarditis - Myocarditis – Endocarditis - IHDs

Chest: Interstitial pulmonary fibrosis and Caplan's syndrome: (R.A. - lung nodules - pneumoconiosis)

Abdomen: Pancreatitis and Hepatosplenomegaly

C.N.S: Psychosis, Chorea, Depression Epilepsy

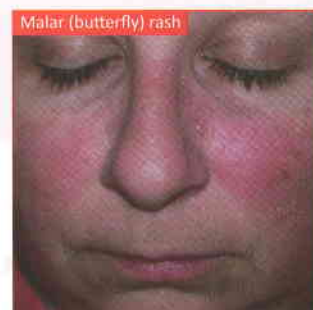
Skin: Subcutaneous nodule and Palmer erythema

eye: Conjunctivitis, Scleritis and scleromalacia

Blood: Anamia

Skin:

Photosensitivity, Malar (butterfly) rash, erythema, discoid lesions, alopecia, oral ulcers, telangectasia & Raynaud's phenomenon

**Diagnostic criteria**

(4 or more of these criteria)

1. Malar rash
2. Discoid rash
3. Photosensitivity
4. Painless oral ulcers
5. Pleurisy or pericarditis
6. Psychosis or seizures
7. Peripheral joints arthritis (2 or more)
8. Pancytopenia
9. Proteinuria or cast
10. +ve ANA antibody
11. Immunological investigations: +ve anti DNA ab or anti-sm ab

► Treatment:

Modifications of lifestyle

Use of sunscreen & Avoidance of estrogens

Combination of therapies that include

NSAIDs, Corticosteroids, Chloroquine, Methotrexate, Azathioprine, Cyclophosphamide

Plasmapheresis & intravenous immunoglobulins

ANKYLOSING SPONDYLITIS

► Definition:

Type of the spondylo-arthropathies characterized by sacroilitis, spondylitis and marked fibrosis.

► Pathophysiology

Enthesitis: Inflammation of ligament at the site of attachment then osteopenia then erosion then ossification

► Clinical Picture:

A- Articular

Axial

Bilateral sacroilitis:

Pain: Mid-low back stiffness, pain at rest, partially improved by movement

On examination: painful sacroiliac joint

Spinal affection:

Spinal restriction: Lumbar-thoracic- cervical spine in flexion-extension-rotation

On examination:

Postural changes: (Question Mark sign)

increased dorsal kyphosis, decreased lumbar lordosis, forward protrusion of cervical spine (flexion)

Increased occiput-to-wall distance (flexion attitude)

Decreased chest wall expansion

Decreased Schöber test (decreased forward flexion of lumbar spine)

see the pictures of examination before ...

Peripheral

Asymmetrical large joint peripheral arthritis, mainly lower limbs with **centrifugal spread**

B- Extra-articular:

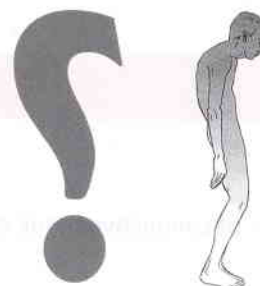
Genito-urinary: Prostatitis

Eye: Acute anterior uveitis

Kidney: amyloidosis and IgA nephropathy

GIT: IBDs (UC)

Neurology: atlantoaxial subluxation



► N.B.

AS = 5 As

anterior uveitis, aortitis, amyloidosis, IgA nephropathy and apical fibrosis

► Investigations:

X-ray:

Sacroiliac joint:

Early: Pseudo-widening of the joint due to erosion

Late: Joint sclerosis (bony fusion)

Spine:

Early:

Square-shaped vertebra (due to erosion and sclerosis of the its corners)

Late:

Ossification of the outer fibers of annulus fibrosis (bridging syndesmophytes)

Ossification of the longitudinal ligament producing a

bamboo spine or Dagger

Laboratory tests:

RF negative

Elevated ESR & C-reactive protein

► Treatment:

Physiotherapy:

Exercise (e.g. swimming).

Pharmacological therapy:

NSAIDs

DMARDs

for peripheral arthritis (sulfasalazine, methotrexate)

Infliximab for axial involvement

Symptomatic treatment:

as for extra-articular manifestations

Surgery: Hip replacement, Vertebral osteotomy for marked deformity

PSORIATIC ARTHRITIS

► Definition:

The most commonly a seronegative oligoarthritis found in patients with psoriasis, with less common, but characteristic, differentiating features of distal joint involvement and arthritis mutilans.

► Clinical Picture:

Skin and nail changes are typical findings

erythematous plaques with silvery scale

Nail: pitting, ridging, discolouration, hyperkeratosis or onycholysis

Joints:

5 general patterns

- 1- Arthritis of DIP joints with nail changes
- 2- Destructive arthritis (5%)
- 3- Symmetrical polyarthritis (similar to RA)
- 4- Sacroilitis and spondylitis (usually older, male patients similar to Ank. Sp.)
- 5- Asymmetrical (most common)

Other features (complications)

Eye: Conjunctivitis, Iritis

Heart: Aortic insufficiency

Lung: Apical lung fibrosis

Neurological: Peripheral nervous system – Cauda equina

► Investigations:

Serology: RA -ve

X-Ray:

Floating syndesmophytes
Pencil and cup appearance at IP joints
Osteolysis, periostitis



► Treatment:

Treatment of the skin disease:

steroid cream, salicylic/retinoic acid, tar
NSAIDs

Intra-articular steroids if NSAIDs fail to reduce synovitis and pain

DMARDs: methotrexate, sulfasalazine, cyclosporine, gold, chloroquine, azathioprine, and TNF inhibitors (infliximab)

SCLERODERMA

► Definition:

Generalized disorder of connective tissue characterized by fibrosis and degenerative changes in blood vessels, visceral organ and **skin**.

► Incidence:

F:M = 3-4:1 & Associated with HLA DRI, DR3, DR5

► Pathogenesis:

Fibrosis and degenerative changes in skin and viscera

Collagen deposition leading to atrophy and fibrosis

Blood vessels: intimal proliferation and medial degeneration progressive obliteration secondary fibrosis of tissue.

► Clinical Picture:

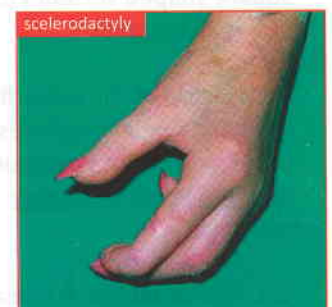
Cutaneous

Hand:

Bilateral symmetrical swelling of fingers, hands and feet leading to skin tightening (**sclerodactyly**)

Characteristic face: Mask, Fish mouth, beak nose, Radial Peri-oral furrows

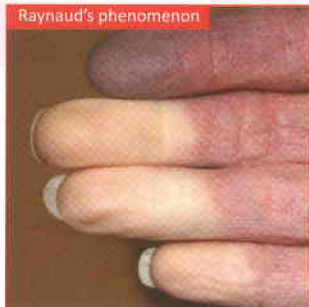
Other skin changes: Atrophy, ulcerations, Hypo - and Hyperpigmentation, Telangiectasias, Calcinosis, Periungual erythema, Pruritus



Raynaud's phenomenon

Abnormal response of peripheral blood vessels to cold which lead to specific color changes and pain:

white: ischemia
then **blue:** increased metabolites
then **red:** vaso dilatation due to vasodilators

**Diagnostic Criteria**

(1 major or > 2 minor of the following)

a-Major criterion:

proximal scleroderma

b-Minor criteria:

Sclerodactyly

Digital pitting scars or loss of finger pad,

Bi-basilar Pulmonary fibrosis

► Types:**1- Localized**

Morphea and Linear sclerosis

2- Limited (CREST)

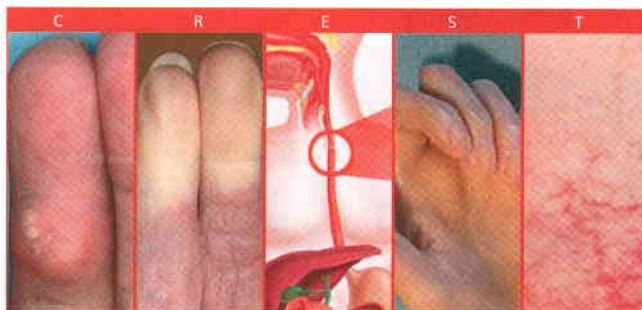
1- Calcinosis: calcium deposits in skin

2- Raynaud's Phenomenon: spasm of blood vessels in response to cold

3- Esophageal Dysfunction: decreased esophageal motility

4- Sclerodactyly: tightening of the fingers skin

5- Telangiectasia: dilatation of capillaries causing red marks

**3- Diffuse**

Widespread skin lesion & Early visceral (renal, pulmonary)

4- Systemic Sclerosis**5- Overlap****► Treatment:**

General: Avoidance of exposure to cold

Specific:

Penicillamine

Steroids

Others: methotrexate/cyclosporine

Symptomatic treatment:

- GERD: Proton pump inhibitors
- Intestinal bacterial overgrowth: broad-spectrum antibiotics (tetracycline, flagyl)
- Raynaud's: Ca blockers, Vasodilators, Nitroglycerin cream, systemic PGE2 inhibitors
- Renal disease or HTN: ACE inhibitors
- Myositis or pericarditis: steroids.

Extra-cutaneous:**GI tract:**

Distal esophageal hypo-motility (Dysphagia)
Lower esophageal sphincter dysfunction (GERD)
Small bowel hypo-motility (Bacterial overgrowth, malabsorption, weight loss)
Large intestine hypo-motility (May cause constipation)

Kidneys:

Scleroderma renal crisis: (10-15%) may lead to malignant HTN, oliguria and microangiopathic hemolytic anemia

Urine abnormalities: Mild proteinuria, creatinine, elevation and/or HTN (commonest)

Lungs:

Pleural: pleurisy and pleural effusions

Lung: interstitial fibrosis – carcinoma

Vascular: pulmonary HTN

Extra thoracic: tight skin may lead to restrictive hypoventilation.

CVS:

pericarditis, pericardial effusion or constrictive.

Myo: left ventricular dysfunction, arrhythmias

Musculoskeletal:

Joint: poly-arthritis or -arthritis (both small and large joints)

Muscle: Myalgia or myositis.

Resorption of distal tufts: radiological finding

Endocrine: May have hypothyroidism

► Investigations:

Blood: CBC, ESR, CRP & KFT

Serological tests:

- Anti-scl 70
- Anti-topoisomerase 1
- Anti-centromere (In limited type)

Images

- **Hand:** calcinosis of the fingers – resorption of distal tufts
- **Chest:** IPF
- **GI:** barium contrast
- **Biopsy:** from the skin

OTHER C.T. DISORDERS

► Mixed Connective Tissue Disorder:

Clinical:

- Acrosclerosis
- Myositis
- Edema of joints (Articular)
- Raynaud's

Lab:

Anti Ribo Nucleo Protein (ARNP)

► Overlap Syndrome:

Presence of more than one C.T disease

As:

RA + SLE = Rheubus

Scleroderma + Dermatomyositis

► Dermatomyositis:

(Dermato) Skin lesion

- Heliotrope
- Shawl sign
- Gottron nodule

(Myositis) Proximal Muscle:

- Weakness
- Pain
- FAHM





HAEMATOLOGY, RENAL AND ENDOCRINE

“

Rare presentations of common diseases are much more common than common presentations of rare diseases.

”

HAEMATOLOGICAL HISTORY

► Personal History:

1. Name: اسم حضرتك ايه؟

to be familiar with the patient.

2. Age: عندك كام سنة؟

As certain diseases are more common in certain ages, e.g.

6 months	young age	middle age	old age
Thalassemia	ALL	ITP & HA	Multiple Myeloma & CLL

3. Sex:

Haemophilia & G6PD-D in male (X linked)

ITP more common in female

4. Occupation: بتشتغل ايه؟

Lead exposure: Sideroblastic anemia

5. Marital state: متزوج؟ عندك اولاد؟ كام؟ اصغرهم عنده كام سنة؟

Severe chronic anemia → Infertility

Treatment of Lymphoma or MM with chemotherapy or radio therapy → Infertility

6. Residence: ساكن فين؟

Mediterranean area → Thalassemia

7. Special habits:

↑ alcohol intake → Megaloblastic anemia

8. Menstrual History:

Chronic blood loss → ↓ Fe anemia

ITP → Heavy period

► Complaint:

- Usually Headache, fatigue
- Skin lesion
- Swelling (LN, liver or spleen)
- Abdominal Pain (HSM)
- Yellowish discoloration in HA

► History of present illness (H.P.I.):

- Analysis of complaint as usual
- Analysis of haematological symptoms (see next)
- Other symptoms
- Investigations & treatment

► Haematological Symptoms :

RBCs (Hb)

↓ WBCs

Bleeding

Evidence of Haemolysis

Evidence of RES Hyperplasia

Hyperviscosity manifestations

1- ↓ RBCs (Hb) :

- Headache, Blurring of vision, dizziness & syncopal attacks
- Anginal pain, dyspnea & palpitations
- Fatigue & I.C

2- ↓ WBCs (Number or function) :

- ↓ Number as in aplastic anemia
- ↓ Function as in leukemia
- Resulting in:

↑↑ Infection:

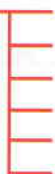
Sore throat

Stomatitis

Fungal Infection

3- Bleeding:

Due to:  Platelet disorder (Number or function)
or blood vessel disease (as Vasculitis)
or coagulation factor defect (as haemophilia)

Bleeding Per Orifices:
 Epistaxis
Haematuria
Haematochezia
Bleeding gum
Haematemesis
Haemoptysis
Skin lesion:
 Petichiae <2mm
Purpuric 2mm - 1 cm
Ecchymosis > 1cm

Skin manifestations may appear spontaneously or after trauma

4- Evidence of Haemolysis :

Jaundice, Haemolytic crisis & history of repeated BT

► Jaundice :**Definition:**

yellow discoloration of skin & mucous membranes due to increased level of bilirubin > 2.5 mg %.

Analysis of the jaundice:**1. Onset:**

- **Acute:** viral hepatitis, calculi obstruction.
- **Gradual:** malignant obstruction, cirrhosis.

2. Course:

- **Progressive:** malignant obstruction, cirrhosis.
- **Regressive:** viral hepatitis.
- **Intermittent:** calculi obstructive jaundice, periampullary carcinoma, hemolytic jaundice, chronic active hepatitis.

3. Duration:

- **Short:** viral hepatitis.
- **Long:** cirrhosis.
- **More than 2 years exclude malignancy.**

4. Urine:

- **Dark:** hepatocellular & obstructive.
- **Normal:** hemolytic.

5. Stool:

- **Pale clay:** in obstructive.
- **Dark:** in hemolytic.
- **Slightly pale** in hepatocellular.

6. Anorexia, nausea, vomiting:

Occur at the onset of viral hepatitis.

7. Fever:

- **Hepatocellular:** pre-icteric phase of viral hepatitis.
- **Hemolytic:** during hemolytic crisis - malaria - incompatible blood transfusion.
- **Obstructive:** Charcot's triad.

8. Bleeding tendency: from skin, orifices in:

- Liver cell failure.
- Obstructive jaundice.

► Haemolytic Crisis :

- Dizziness, blurring of vision دوخة وزغللة
- fever & rigors سخونة ورعشة
- Headache, Pain & colors (Dark urine & deep jaundice) صداع, الألم, اللون

► N.B.**Jaundice may be:**

- **Viral :** acute - short - regressive.
- **Calculi :** acute intermittent.
- **Malignancy :** gradual - progressive (2 months).
- **Chronic liver disease :** gradual - intermittent (2Y).

9. Pain:

- **Hepatocellular:** dull-aching pain in right hypochondrium in case of viral hepatitis.
- **Hemolytic:** bone pain and abdominal pain in hemolytic crisis.
- **Obstructive:**
 - Biliary colic (calculi obstruction).
 - Epigastric pain radiating to the back (malignant obstruction).

10. Pruritis:

- In obstructive jaundice.
- Primary biliary colic.

5- Evidence of RES Hyperplasia:

The following cases maybe presented by **abdominal pain** or **swelling**:

- **HSM & LN++** may occur in malignancies due to infiltration
- **HSM** may occur In chronic HA due to extra medullary haematopoiesis
- **Splenomegaly** occur in any type of anemia due to extra medullary haematopoiesis

6- Hyperviscosity manifestations:

as thromboembolism as in multiple myeloma, leukemia, polycythemiaetc.

► Other Systems:**CNS:**

- IC Hge in Purpura or Haemophilia
- Infiltration in Blood Malignancies

CVS: Dyspnea, Palpitation & arrhythmia in Anemia

Chest: Pleural or lung infiltration in Blood Malignancies

Abdomen: See before

Others:

- Bone pain & Fracture : MM
- Joint Pain & Swelling: Haemophilia

► Past History :**1- Drug History:**

- **Aplastic Anemia:**
 - Antithyroid, Antiepilepsy
 - Antibiotics, Antidiabetics
 - Anticancer
- **Haemolytic Anemia:** Alpha methyl dopa
- **Bleeding:** use of anticoagulants

2- History of radiotherapy: BM depression with radiotherapy in malignancies

3- History of Chronic Diseases: as TB, DM, Tumors, Hepatitis

► Family History :

Similar Condition in the family: In Hereditary HA:

- Hereditary Spherocytosis (**AD**)
- Thalassemia & Sickle cell anemias (**AR**)
- G6PD-D & Haemophilia (**X- Linked**)

HAEMATOLOGICAL EXAMINATION**A** **أرقام Vitals: Blood pressure, pulse, Respiratory rate, Temperature.**

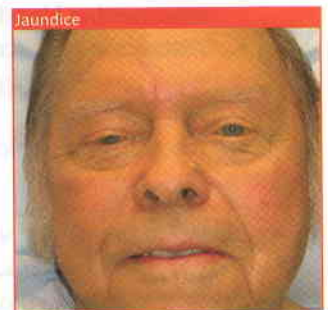
- **Pulse:** Big pulse volume & WHP: in Anemia (Hyperdynamic circulation)
- **BP:** Hypotention: in sever anemia
- **Temp.:** Fever:
 - haemolytic crisis
 - Leukemia
 - ↓ WBCs (infections)
 - Lymphoma
- **R.R.:** Tachypnea: in anemia

B **Built:** Short stature: In chronic haemolytic anemia since childhood**C** **Complexion:**

Pallor: Anaemic.

Jaundice (Haemolytic)

Cyanosis: Never occur with anemia (why?)



D Decubitus or position

Orthopnea: in anemic HF

Mongoloid Face See below

Atrophic Glossitis In ↓ Fe Anemia

Beefy tongue in Megaloblastic anemia

Bleeding Gums see pictures below

Congested neck vein: in Hyperdynamic Circulation , Anemic HF & LN+ Compress SVC

(H & N):

UL & Skin:

Spooning of nails (Koilonychia) in ↓ Fe anemia

Petechiae, Purpuric eruption or Ecchymosis See table and pictures below

Hyperpigmentation in thalassemia

lower limb:

Leg Ulcer: In Sickle Cell Anemia

Lower limb edema

Hypoxia → ↑ Capillary permeability

Anemic HF

↓ GFR → Salt & water retention

NB : tender sternum in leukemia

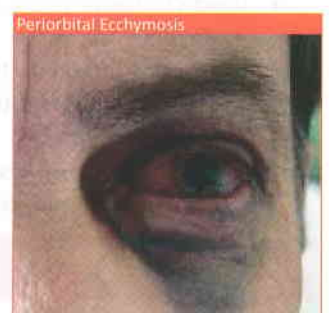
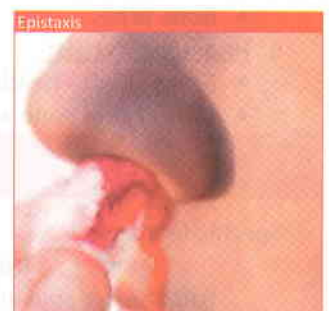
► Mongoloid face:

- Expansion of forehead (protrusion of frontal & parietal bones) + Widening of the medulla due to hyperactive bone marrow
- Depressed nasal bridges
- Prominent maxilla
- Protruding upper central incisors



Petichiae	Ecchymosis
Interadermal Hge	Subcutaneous Hge
sized < 2mm	sized >1cm
not raised	raised
No color changes	color changes
not related to trauma	related to trauma

Note: Purpura (2 mm to 1 cm)



+ Other Systems:

CVS:

- ↑ S1 & S2
- S3: Volume overload
- Haemic Murmur (Soft systolic over base of the heart particularly pulmonary area)

Abdomen:

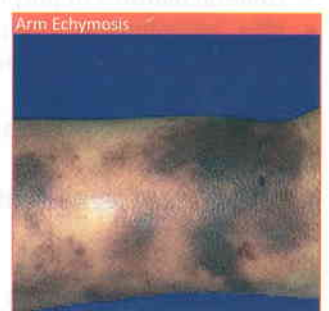
- HSM
- Evidence of splenectomy Scar & Percussion on traub's area (resonant)

LN:

- Chronic HA
- Leukemia or Lymphoma

Joints:

- Haemarthrosis in haemophilia



THALASSEMIA

An example of chronic haemolytic anemia

Pathophysiology: R.B.C.s life span.

1. **Hepatosplenomegaly.**

2. **Hemoglobin:**

- Heme :
 - Iron (bronze diabetes → cardiomyopathy, skin ulcers).
 - Bilirubin → bilirubin → pigmented stones in G.B.
- Globin.

3. **Anemia: with mild pallor**

↑ anemia & pallor in:

- Haemolytic crisis.
- Aplastic crisis.
- Megaloblastic crisis.
- Hyper splenism.

4. **Jaundice: mild**

↑ jaundice in:

- Haemolytic crisis.
- Hepatitis (Blood transfusion).
- Incompatible blood transfusion (rare).
- Obstructive jaundice.

5. **Bone marrow changes:**

- Mongoloid face.
- Bone ache.

6. **Haemolytic crisis:**

- Fever - rigor - headache - dizziness.
- Dark urine - bone ache.

Clinical pictures:

General examination:

- Pallor / jaundice.
- Pulse → hyperdynamic circulation.
- Lower limb → leg ulcers.

Abdominal examination:

- H.S.M. or scar of splenectomy.

Heart examination:

7. Hyperdynamic with haemic murmurs
8. D.D. with A.I.

Investigations and treatment:

CBC, Hb electrophoresis

SICKLE CELL ANEMIA

Specific features:

- **Autosplenectomy:** from recurrent splenic infarction
Palpation of spleen in adult: never sickle cell anemia
- **Vaso-Occlusive crisis:** sudden ischemia
 - **Cardiac:** MI
 - **Chest:** Pulmonary Infarction, Cor-Pulmonale
 - **Abdomen:** Mesenteric occlusion: acute abdomen
 - **Genital:** Priapism
 - **Neurology:** Strokes (Focal lesions: Hemiplegia, sudden blindness)
 - **Limbs:** Ischemic ulcers and gangrene, Hand and foot syndrome (Chronic Dactylitis)

ITP

- General features of purpura
- **skin examination:** Purpuric eruption: generalized, variable in size, not raised above the skin & don't blanch with pressure
- **Spleen** is not palpable, and if palpable it would never be hugely enlarged
- **No history of blood transfusion**, and if there, it would be just once

Evan Syndrome:

Autoimmune Haemolytic Anemia + Autoimmune Thrombocytopenia

► **N.B.**

Hess Tess

- circle of 5 cm in diameter is marked in the antecubital fossa then inflate the sphygmomanometer midway between Systolic and diastolic BP for about 5 min.
- count the numbers of petichae within the circle.
- if more than 10 petichae → +ve test.
- it is +ve in all cases of purpura.

CHRONIC RENAL FAILURE

Definition:

A condition characterized by progressive and irreversible reduction of renal function. The clinical symptoms and signs of end stage renal failure are known as uraemia or uraemic syndrome.

► Complaint:

On patient's own words + duration ؟ ايه اللي تاعبك ؟ ايه اللي جابك المستشفى ؟ بقاله اد ايه التعب ؟
(take the most recent and most important complaint and it should be brief)
Maybe Headache due to HTN or fatigue due to anemia

► History of present illness (H.P.I.):

Pathology, History & Examinations are explained in the next table:

1- H ₂ O, Electrolyte & Acid Base Disturbance	History	Examination
H₂O: → Polyuria → Oliguria in ESRD	كمية البول اتغيرت؟	
Na⁺: → Glomerular → Na retention → HTN → Tubular → Na Loss → Hypotension	بتاخذ ادوية للضغط؟ او عندك هبوط؟	Measure BP
K⁺: → Extracellular shift due to acidosis → Hyper K	عندك ضعف في العضلات او نقص في التركيز؟	Examine Muscles
Metabolic Acidosis: → failure of HCO ₃ reabsorption		Observe for kausssmaul breathing
2- CVS		
Hypertension or Hypotension		Measure BP
Pericarditis	في ألم في الصدر؟ في كحة او تزييق؟	Pericardial Rub
3- Chest		
Plurisy Uremic asthma Haemoptsis	في كرشة نفس؟ ألم في الصدر مع النفس؟ كحة بدم؟	kaussmaul breathing Rhonchi Pleural Rub
4- GIT		
Mouth: Uremic odour tongue is dry and coated	ريحة فمك اتغيرت؟ لسانك ابيض؟	Halitosis White coated tongue
Stomach: A N V GIT bleeding	شهيتك للاكل اتغيرت؟ في ترجيع دم ؟	
Intestine: Constipation, Diarrhea (Dysentery)	في امساك او اسهال؟ او دم مع البراز	
5- CNS		
A Apathy, Astrixis B Psychotic: Irritability B PN & Myopathy C Confusion D Dementia (Dialysis)	في تشنجات او اغماءات؟ في ضعف في الاحساس؟ في ضعف في العضلات؟	Apathy , Astrixis Gloves & stocks of hypothesis
6- Muscle & skeletal		
↑ P → ↓ Ca → 2^o Hyperparathyroidism → Osteoprosis (Generalized bony pain)	ألم في العضلات	
7- Skin		
Pallor + Urochrome pigmentation → Earthy look		Earthy look
Pruritis	في هرش ؟	Scratching marks

8- Blood	History	Examination
Anemia (All Types)	صداع , دوخه , زغلله , اغماءات؟ تعب وضعف عام؟ ألم بالصدر	Pallor + CVS (↑S1, S3 & haemic murmur)
Bleeding (Toxemia interfere with platlet & coagulation factors functions)	عندك نزيف في أي مكان أو طفح جلدي؟	Petechiae or ecchymosis

► Past History :

- Reccurent loin pain (**Pyelonephritis** = the commonest in Egypt)
- DM** (the commonest world wide)
- HTN
- Collagen disease & Gout
- Renal stones
- NSAID

► Family History :

- Polycystic Kidney (AD)

Earthy look in CRF



RENAL EDEMA

History as abdominal sheet but focus on the following:

► **personal history** as before

► **Complaint** Puffiness of eyelids

► Present History

1. **Analysis of the complaint:** OCD, ↑↓, associated symptoms

2. **Symptoms of the same system:**

- Urinary symptoms** : change in the amount or in colour
Oliguria & hematuria in nephritic syndrome
- Headache (hypertension)** : in nephritic syndrome
- Symptoms of complications:**
 - Chest infection: fever, dyspnea
 - Skin infection
 - Urinary tract infections: dysuria,... etc
 - Abdominal: pain vomiting (peritonitis or GIT congestion) & diarrhea
 - Rash, arthritis (with lupus nephritis- Henoch Schonlein purpura)

4. **Investigations & treatment:**

- Steroids or immunosuppressive & hospitalization

3. **Symptoms of other systems:**

- Hepatic & cardiac to exclude other causes of edema

Examination as general & local abdomen but focus on:

1. **General examination:**

- BP: normal in nephrotic & high in nephritic,
- Puffy eyelids
 - Oedema start periorbital then face then sacrum then genitalia then general
- Pallor
- Xanthomata (hyperlipidemia)
- Cushinoid features in long standing treatment with steroids
- Lower limb edema: bilateral pitting not tender reaching.

► N.B.

Cause of Hypertension in nephrotic syndrome:

- Nephritic nephrotic.
- Collagen diseases e.g. SLE
- Complication of atherosclerosis or renal failure
- Steroids

2. **Abdominal examination:**

- Generalized distention of the abdomen
- Stretched skin, Visible veins
- Divarication of recti
- Wide subcostal angle
- Tender & rigid abdomen suspect in peritonitis
- Ascites examination
- Scrotal edema

Diagnosis

A case of generalized pitting oedema (associated with moderate or tense ascites for investigation) most probably nephrotic syndrome in (first attack or in relapse) complicated by acute bronchitis.

► **Why Nephrotic ?**

- Character & distribution of edema.
- edema started over eye "periorbital"
- Gradual onset.
- absent hematuria with normal blood pressure.

GH & ACROMEGALY

Hormonal Actions & Pathology	History	Examination
A-Mainly Metabolic Action:		
CHO:		
Diabetogenic (DM): ↑ Gluconeogenesis & ↓ Glucose uptake by cells	بتشرب ميه كثير؟ بتدخل الحمام للبول كثير؟ كية البول كبيرة؟	Examin as a diabetic patient
Fat:		
↑ Lipolysis with loss of S.C. fat - Excretion of fat with sebum + hypertrophy & hyper plasia of sweat gland	بتعرق كثير؟ العرق غزير ودهنى؟	- wrinkling of skin of forehead - Greasy sweating
Proteins:		
Bone: - Face: coarse featur - Feet & hands - Vertebral column - Joints	هل ملامح وشك اتغيرت؟ هل ايدك او قدمك كبرو في الحجم؟ عندل الام في المفاصل	Big skull (See below) - Spade like hand & big feet - Kyphosis - Osteoarthritis
Muscle: - Early: ↑ in power - Later on: Myopathy	قوتك العضليه اخبارها ايه؟	Muscles Examination (Power as in neurology)
Viscera: - Liver & Spleen - Heart: Cardiomyopathy & HF - Prostate: BPH - Colon: Polyps	في تقل في جنبك اليمين والشمال؟ هل عندك كرشه تفس اة رفرفه او زغلله؟ هل عندك مشاكل اثناء التبول؟ هل عندك تغير في طبيعة البراز؟ اسهال او امساك او تعنية	- HSM (Examine liver & spleen) - Examin heart for chamber enlargment - PR examination
Electrolytes:		
Na retention lead to HTN	بتاخذ ادوية للضغط؟	Mean Arterial Blood Pressure
CNS:		
- PN - Carpal tunnel syndrome	في ألم او شكشكة او تنميل في الاطراف؟	- Examine for glove & stock of hypothesia - Thick ulner nerve, tinnel & phalen test
Pressure Manifestation:		
due to macroadenoma	هل عندك صداع مستمر وترجيع وزغلله؟	Confrontation Test

Big Skull:

- Thickening of the cortex
- Pneumanization of frontal air sinuses
- Prominent external Occipital Protuberance
- Big mastoid process
- Prognathism & wide separation of teeth

► N.B.

Cause of death in acromegalic patient:

- Sleep apnea (respiratory)
- Heart failure (Cardiovascular)
- DM
- Colonic Polyposis (Colon Cancer)

Acromegalic face



Spade like hand



► N.B.

Colonic Polyposis usually associated with skin tag

► **Gigantism :**

Definition: Increased GH secretion before fusion of epiphysis (before puberty)

Aetiology:

- Hyperplasia of acidophil cells
- Acidophil adenoma

Clinical picture:

- Generalized overgrowth of metaphysis of long bones leading to disproportionate gigantism (**span > height**) + (**lower segment > upper segment**).
- Later on features of acromegaly develops.
- End stage or decline stage: -weakness, fatigue due to pituitary insufficiency.

► **DD of tall Stature :**

Definition: Height above 97th percentile of normal individual for the same age & sex

Disease	Built	Others
Familial & Racial	Proportionate	Normal GH
Gigantism	Disproportionate	High GH level
Hypogonadism	Disproportionate	Feminine
Cerebral Gigantism (Soto's Syndrome)		in first 5 years of life only, MR, big skull & normal GH level
Marfan's syndrome	See Cardiology	
Klinefelter's syndrome (XXY)	Tall, Slim & underbuilt	
Homocystinuria		
Hyperthyroidism		
Sexual Precocity	Early accelerated growth, later on shorter stature	

► **DD of Short Stature :**

Definition: Height below 3rd percentile of normal individual for the same age & sex

Aetiology:

A. Familial: the commonest cause.

B. Genetic disorders:

1. Mongolism (Down syndrome): Trisomy 21
2. Turner's syndrome XO: ovarian dysgenesis, 1ry amenorrhea webbing of neck, increase carrying angle, coarctation of aorta.
3. Microcephaly.
4. Progeria: premature senility.

C. Endocrinal:

1. GH deficiency : Levi-Lorain, Frohlich's & Laurence-Moon-Biedle syndromes.
2. T4 deficiency: cretinism & juvenile myxedema.
3. ↑ Sex hormones: precocious puberty (tall child short adult).
4. ↑ Cortisol: Cushing syndrome or excess steroid treatment (Cortisol block the ability of GH to produce somatomedin).
5. ↓ Insulin: Juvenile DM excess glucose inhibit GH release

D. Skeletal:

• **congenital:**

1. Achondroplasia: short limbs & normal trunk.
2. Osteochondrodystrophy: limbs & trunk are short and deformed.
3. Osteogenesis imperfecta fragile bone, pathological fracture + malfusion &
4. dwarfism, joint dislocation, blue sclera, deafness due to otosclerosis.

• **Acquired:**

1. Rickets
2. Paget's disease.
3. Pott's disease.

E. Chronic severe illness during the childhood:

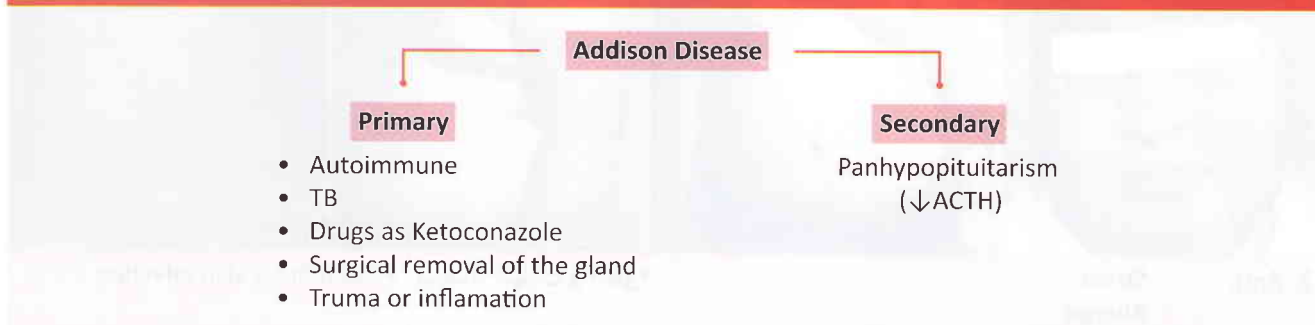
1. **CVS:** rheumatic fever, congenital heart disease.
2. **Lung:** polycystic lung.
3. **GIT:** malabsorption, lipid storage, parasitic infestation, malnutrition, liver cirrhosis.
4. **Kidney:** chronic nephritis.

CORTISOL AND CUSHING DISEASE

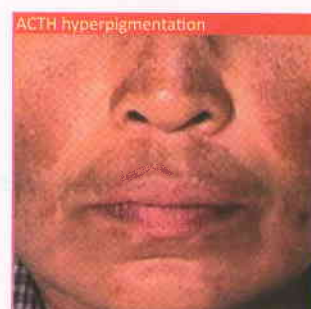
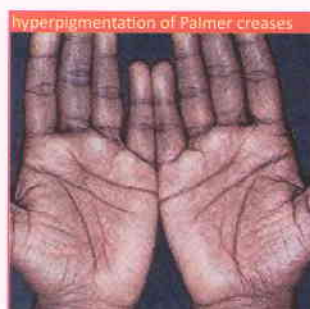
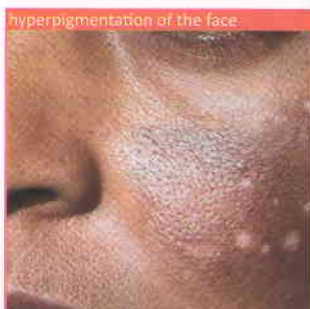
Hormonal Action & Pathology	History	Examination
1- Metabolic: CHO: Hyperglycemia Fat: ↑ Lipolysis with abnormal distribution Protein: ↑ Catabolism: - Ms → Weakness - Skin & BV → Striae & Purpura - Bone → Osteoporosis Vitamins: Anti Vit. D → Osteomalacia Electrolytes: Aldosterone like action: Na & water retention	في اي اعراض للسكر؟ هل شكل وشك اتغير؟ او جسمك زاد في اماكن وامكن لا؟ في ضعف في العضلات؟ في خطوط حمرا في جسمك؟ في الام في العظام؟ او حصل كسور؟ في ورم في رجلك؟	- Signs of DM Moon face, Buffalo Hump, Trunkal Obesity with thin limbs - Muscle Wasting - Striae Rubra - Purpura - LL Oedema
Moon face  Trunkal Obesity  Stria rubra and purpura 		
2- Anti: - Stress - Allergic - Inflammatory	بيحصلك التهابات في الحلق؟	Search for skin infection
3- Androgenic Like Action:	ظهرك حب شباب؟ ظهرك شعر في الوجه او الصدر او تغيرات في الدورة؟ (Females only)	- Acne Vulgaris - Hirsutism (in females)
Acne + Hirsutism  Acne  Hirsutism 		
4- Bone Marrow: ↑ RBCs (Polycythemia) ↑ Neutrophils ↓ Lymphocyte, Monocyte, eosinophils & basophils	في الجو الحار وشك بيحمر؟ طب في البرد بتزرق؟	- Plethoric face - cyanosis with cold
5- ↑ Sensitivity of Receptors to Catecholamines:		- Measure BP (↑) Causes of hypertension in Cushing: - Polycythemia - Salt & water retention ↑ Sensitivity of receptors to catecholamines
6- ↓ Gastric Mucous Secresion:	الم وحرقان في المعدة؟	Epigastric Tenderness
7- Psychosis:		

Cushing Types		History	Examination
↑↑ ACTH • Pituitary (Disease) • Ectopic in paramalignant \$ • Synacthen drug	↓↓ ACTH • Supra Renal Disease • Steroids (Cushinoid)	هل اخدت ادوية كورتيزون؟ (Pituitary) عندك صداع جامد ؟ في اى مشاكل في جسمك او اورام في مكان ؟	• pituitary causes: do confrontation test. • Suprarenal: as kidney exam
ACTH is a darkening hormone		History	Examination
		هل لون جلدك اغمق؟	• Examine Skin color

ADDISON DISEASE



Hormonal Action & Pathology	History	Examination
Hypotention ↓ Aldosterone & ↓ Cortisol	عندك صداع؟ لما بتقوم تقف مره واحده ممكن يجيلك اغماء؟	Measure BP ↓ (110\70)
Hypoglycemia ↓ Cortisol	حصليك غيبوبة نقص السكر قبل كذا؟	
Athenia ↓ BP, ↓ Glucose & ↓ Androgen	عندك ضعف عام؟	Apathetic look
Hyperpigmentation only in 1 st (↑ ACTH)	ظهرلك بقع في جلدك او فمك او لسانك؟	Hyper pigmentation in: - Exposed Areas (Face & neck) - Scars - Areola - Groin & Axilla - M.M. in mouth & tongue
↑S.K.	عندك ضعف في العضلات؟ او نقص في التركيز؟	
↑ H⁺ → Acidosis & GIT disturbance	في الم في المعدة او غثيان او ترجيع؟	



HISTORY OF THYROID CASE

► Personal History:

- 1. Name:** اسم حضرتك ايه؟
to be familiar with the patient.
- 2. Age:** عندك كام سنة؟
As certain diseases are more common in certain ages, e.g.

15-20 years	20-50 years	more than 50 years
physiological goiter	single nodular goiter	anaplastic carcinoma

- 3. Sex:**
Benign thyroid swelling 9:1 male: female
Malignant thyroid conditions 3:1 male: female
- 4. Occupation:** بتشتغل ايه؟
- 5. Marital state:** متزوج؟ عندك اولاد؟ كام؟ اصغرهم عنده كام سنة؟
- 6. Residence:** ساكن فين؟
- 7. Special habits:**
بتدخن؟ كام سيجارة في اليوم؟ بقالك كام سنة؟ بطلت في خلال هذه الفترة؟
بتشرب خمر أو مخدرات؟ بطريقة منتظمة ولا في المناسبات؟ نوع الخمر ايه؟
- 8. Menstrual History:**
2nd amenorrhoea maybe due to pregnancy or thyrotoxicosis.

► Complaint:

On patient's own words + duration ؟ ايه اللي تاعبك ؟ ايه اللي جابك المستشفى؟ بقاله اد ايه التعب ؟
(take the most recent and most important complaint and it should be brief)

► History of present illness (H.P.I):

1. Analysis of complaint.
 2. Other system affection.
 3. Investigation & treatment.
- Pain
Swelling
disturbance of function ——— Pressure manifestations
toxic manifestations

1- Analysis Of The Complaint:

- a. Pain analysis:** 11 point: 8+3
Onset, course, duration, association, what increase, what decrease, date of last attack, effect of treatment, site, radiation & character
- b. Swelling analysis:**
Onset, course, duration + swelling characters (**site, size, shape, consistency, surface, skin over it**)
- c. Disturbance of function:**
 - 1. pressure manifestations:**



2. toxic manifestations:

- **CNS:** insomnia, fine tremors, irritability
- **CVS:** palpitation بتحسن بضربات قلبك؟
- **Metabolic:** recent heat intolerance هل حسيت انك بقيت مش بتستحمل الحر؟
- **Eye:** a. exophthalmos حسيت ان عينك طلعت برا؟
b. diplopia بتشوف الحاجه اتنين؟
- **GIT:** diarrhea متعود تدخل الحمام كام مره في اليوم؟
- **Urinary:** polyurea هل كمية البول كثيره؟
- **Skin:** sweaty and worm بتحسن ان جلدك دافي وعرقان؟
- **SC tissue:** peritibial myxedema في تورم تحت الجلد في رجليك؟
- **Muscles:** myopathy هل بتحسن بضعف في العضلات وماتر ع شغللك؟
- **bone:** osteoporosis هل في نشران في العظام؟

2- other system affection:

- a. **Lung metastasis:** cough, haemoptysis, chest pain
- b. **bone metastasis:** boneache and pathological fractures

3- investigations and treatment:

Ask about investigations, operations and drugs

► Past History:

1. **Similar attacks** الشكوى اتكررت قبل كذا؟
2. **Chronic diseases** as D.M., hypertension and T.B.
• Diabetes Mellitus: عندك سكر؟ من إمتى؟ أخذت علاج إيه؟ جرعتيه أد إيه؟ آخر تحليل سكر كان كام؟ حصل أي مضاعفات؟
• Hypertension: عندك ضغط؟ من إمتى؟ أخذت علاج إيه؟ جرعتيه أد إيه؟ آخر مرة قيسست الضغط كان كام؟ حصل أي مضاعفات؟
3. **Major operations.** (complications of general or spinal anaesthesia). عملت عمليات جراحية قبل كده؟ عملية إيه؟ من إمتى؟ حصل بعدها مضاعفات أو تلوث في الجرح؟
4. **blood transfusion.** نقلت دم؟
5. **Drug allergy and intake:** بتأخذ أدوية بصفة مستمرة؟ عندك حساسية من أي دواء؟

► Family History:

consanguinity and history of similar conditions
حد في العائلة اشتكي من نفس الشكوى؟ الأب والأم قرايب؟

EXAMINATION OF THYROID CASE

► General Examination:

- A** **Vitals:** أرقام
- Blood pressure: Hypertension
 - Pulse: Tachycardia
 - Temperature: Hyperthermia & heat intolerance
- In thyrotoxicosis
- B** **Built:** increased appetite & weight loss (thyroid paradox)
- C** **Complexion:**
- pallor: thyroid dysfunction
 - cyanosis: in retrosternal goiter
 - jaundice: liver metastasis
 - antithyroid drugs
 - DD: hypercarotenemia in myxedema
- D** **Decubitus or position** orthopnea in heart failure
- E**
- head and neck**
 - Neck: swelling
 - head: skull metastasis
 - upper limb**
 - clubbing (thyroid acropachy)
 - water hammer pulse
 - Lower limb**
 - LL edema in HF
 - Pretibial myxedema
 - palmar erythema
 - fine tremors
- F** **Mentality & Face** فكر

► **Local Examination:****1- Inspection:**

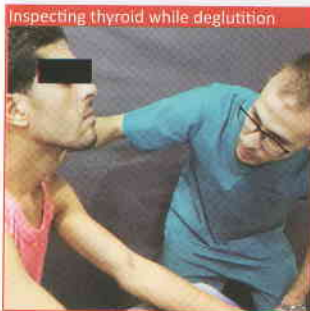
ask the patient to swallow (for thyroid swelling) then to protrude his tongue for thyroglossal cyst and observe the movement...

2- Palpation:**lahey's method of thyroid palpation:**

ask the patient to tilt his neck on one side support the thyroid on the tilted side by the hand and examine it by the other hand on the other side

If swelling describe the following:

- wormth (from front)
- tenderness (from front)
- surface
- edges
- consistency
- relation to the surrounding e.g. skin, muscles and vessels

**special tests:****1. Berry's sign**

palpate the 2 common carotids:
 — both are palpated: **Normal**
 — one only palpated: **Palpate both superficial temporal A.**

 — both are palpated: **displaced carotid**
 — one only palpated: **infiltrated carotid**

2. pemberton sign:

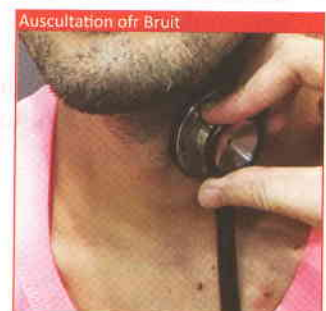
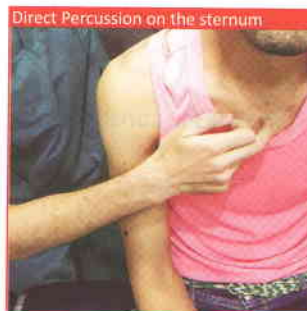
ask the patient to raise his hand above the level of the head; If positive, face poethora occurs.
 pemberton sign is positive in SVC obstruction in retrosternal goiter.

3- Percussion:

Direct percussion on sternum; **dullness in retrosternal goiter.**

4- Auscultation:

Bruit over the lateral lobes in **hyperthyroidism** (on sup. thyroidal artery)

► **Eye signs:****Non infiltrative:**

increased thyroxin in the blood leads to retraction of muller muscles which leads to the following signs:

1. **Stellwag sign:** staring look + infrequent blinking
2. **Dalrymple's sign:** rim of sclera above the cornea
3. **Von Grafe's sign:** lid lag on looking down
4. **Rosenbach's sign:** fine tremors on closure of eye
5. **Slight exophthalmos:** retracted upper lid



Infiltrative:

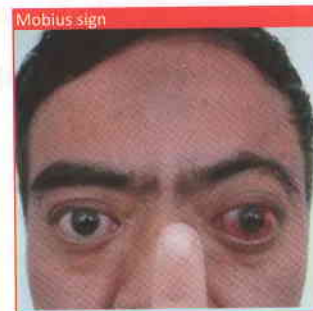
auto antibody called exophthalmos producing substance (EPS) leads to infiltration with myxomatous tissue in retro bulbar space and extra ocular muscles which leads to the following signs:

1. **Exophthalmos:** unilateral or bilateral. may occur before thyrotoxicosis (ocular grave's), the following tests is to DD true and false exophthalmos
 - **Naffziger test:** to see the level supra and infra orbital ridge with cornea.
 - **Frazer's test:** to see the obliteration of sulcus of orbital margin with slight closed eye.
 - **Ruler test:** to see the level of supra & infra orbital margin with cornea by a ruler.
2. **Injected conjunctiva**
3. **Swelling of eye lids and lacrimal glands**
4. **External Ophthalmoplegia:** paresis of oculomotor muscles which lead to:
 - **Mobius sign:** lack of convergence due to weak medial recti
 - **Joffroy sign:** lack of forehead corrugation on looking upword

Malignant exophthalmos with papiledema and corneal ulceration may occur

investigations & treatment

See Theoretical Book

**HYPOTHYROIDISM (MYXOEDEMA)****► General Examination:**

- **A (أرقام):** Cold intolerance - history of hypertension.
- **B (built):** weight gain.
- **C (color):** yellowish discoloration.
- **F:**
 - slow celebration (myxedema madness).
 - bloated face (use old photo).
- **Gonadal:** Menorrhagia, galactorrhea or secondary amenorrhea.
- **Skin:** dry hair and skin
- **Gland:** thyroid swelling or mass.
- **Others:** Fatigue - confusion - weakness - constipation - dyspnea - deep voice.

► Signs**1. Vital signs:**

- Hypothermia.
- Hypertension.
- Bradycardia.

2. Head and neck:

- slow celebration.
- **Myxedema face:**
 - Expressionless, bloated & malar rash.
 - Loss of outer 1/3 of the eye brow, puffiness ± cataract.
 - Thick lips, red glazed tongue (macroglossia).
 - Yellowish skin without sclera icterus (carotenemia).

3. Trunk.

- **Limbs:** myxoedematous oedema.

5. Gonadal:

- **Female:** atrophy of breast, loss of libido, loss of hair & menstrual (menorrhagia, galactorrhea or 2nd amenorrhea).
- **Male:** impotence - gynecomastia.

- **6. Skin:** dry, cold, pale, yellow, scaly & rough - loss of hair, thin, brittle nails with longitudinal ridges. Hyperkeratosis of elbows and knees.

7. Systemic review:

- **C.N.S.:** slow celebration - slurred speech - suspended knee jerk ± ataxia - P.N. - carpal tunnel syndrome.
- **Heart:** pericardial effusion - HB - HF (cardiomyopathy).
- **Abdomen:** ++ liver (fatty).
- **Chest:** pleural effusion (cholesterol effusion).
- **Abdomen:** hypoactive bowel sounds (ileus), myxoedematous ascites.



DIABETES MELLITUS

Diabetes mellitus is characterized by hyperglycemia due to absolute insulin deficiency .

Types:

- **primary** — **Type one** (Insulin deficiency)
- **Secondary** — **Type two** (insulin resistance)
e.g. cancer pancreas

► History :

As with other diseases, you should establish when the diagnosis was made (and how) and the course and treatment of the disease. Additional questions relating to disease monitoring and diabetic complications that you should ask patients with diabetes are as follows:

- **When was it first diagnosed?**
- **How was it first diagnosed?**
- **How was it first managed?**
- **How is it managed now?**
- **If on insulin, when was that first started?**
- **Are they compliant with a diabetic diet?**
- **Are they compliant with their diabetic medication?**
- **How often do they check their blood sugar?**
- **What readings do they normally get (if possible, ask to see their monitoring booklet)?**
- **What is their latest Hb A 1 C (many will know this)?**
- **Have they ever been admitted to hospital with diabetic ketoacidosis (DKA)?**
- **Do they go to a paediatric?**
- **Have they experienced any problems with their feet? Do they use any moisturizers or cream on their feet?**
- **Do they participate in a retinal screening program?**
- **Have they needed a referral to an ophthalmologist?**

► N.B.

In the newly diagnosed diabetic, ask about a history of weight loss (will differentiate type 1 and type 2 diabetes).

► Examination :

- There may be evidence of **weight loss** and **dehydration**.
- In **diabetic ketoacidosis** the breath may have the sweat smell of ketones.
- **Skin infections** with boils and abscess are common.
- **Acanthosis nigricans** (soft, velvety, brown skin) is a sign of hyperinsulinism and is seen frequently in the axilla and groins of patients with insulin-resistant type 2 diabetes.
- **Necrobiosis lipodica**, due to collagen degeneration, may occur on the shins of some patients with type 1 diabetes and often causes chronic ulceration.
- **Diabetic foot ulceration** which caused by multifactorial, including diabetic neuropathy, arterial insufficiency and increased susceptibility to infection.
- **Xanthomata** their presence indicates significant hyperlipidaemia. (See page 32 picture E2)
- **Lipohypertrophy** at the site of insulin injection

Complications of Diabetes mellitus:**Microvascular neuropathic**

- **Eye:** Retinopathy, cataract (impaired vision)
- **Autonomic neuropathy:** postural hypotension, vomiting, diarrhea.
- **Nephropathy:** protein loss, renal failure.
- **Foot disease:** ulceration, arthropathy
- **Peripheral neuropathy:** sensory loss, motor weakness.

Macrovascular

- **Coronary circulation:** myocardial ischaemia and infarction.
- **Cerebral circulation:** transient ischaemic attack (TIA), stroke.
- **Peripheral circulation:** claudication, gangrene and amputation.

Diabetes may present with the classical triad of symptoms :

1. **Polyuria:** due to osmotic diuresis caused by glycosuria.
 2. **Thirst:** due to the resulting loss of fluid and electrolytes.
 3. **Weight loss:** due to fluid depletion and breakdown of fat and muscle secondary to insulin deficiency.
- **Other common symptoms include** tiredness, blurred vision (due to glucose-induced changes in lens refraction) and itching of the genitalia (pruritus vulvae in women or balanitis in men) due to candida yeast infection (thrush)

